American National Standard
for Information Technology

Geographic Information Framework
Data Content Standard
(Part NNN)
Governmental Unit Boundary Data Exchange Standard

Secretariat
INFORMATION TECHNOLOGY INDUSTRY COUNCIL
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Forward (This is not part of American National Standard [designation])

The primary purpose of this standard is to support the exchange of governmental unit (GU) and other legal entity boundary data. This standard seeks to establish a common content of GU and other legal entity boundary datasets. It seeks to decrease the costs of acquiring and exchanging GU and other legal entity boundary data for federal, tribal, state and local users and creators through a common means of describing the data content. Other benefits of adopting the standard include facilitation in maintenance of GU boundaries.

This standard has been developed to fulfill one of the objectives of the National Spatial Data Infrastructure (NSDI), i.e., to create common geographic base data for seven critical data themes. These core themes are considered Framework data, of critical importance to the geographic information infrastructure. The Geospatial One-Stop initiative, a federal e-government initiative, is designed, in part, to expedite the creation of the seven Framework layers.

This standard is being developed by L1, Geographic Information, subcommittee of the InterNational Committee for Information Technology Standards (INCITS) under the auspices of the American National Standards Institute (ANSI). INCITS L1 standards are drafted in accordance with the rules given in the ANSI Style manual for preparation of proposed American National Standards.

This standard contains nine annexes, three of which are normative, six of which are informative.

Committee

Contents

Page

1.0 Scope

The purpose of the Geographic Information Framework Data Content Standards-Governmental Unit Boundary Exchange Standard is to establish the content requirements for the collection and interchange of governmental unit (GU) and other legal entity boundary data and to facilitate the maintenance and use of that information.

This Standard identifies and defines terminology, encoding scheme, and the data components required for describing the GU or other legal entity and its boundary, along with the metadata needed for boundary data exchange. This standard is applicable to all generally recognized GUs and other legal entities, organization-recognized GUs, and other geographic areas.

This Standard adopts the ANSI X3.31 (Federal Information Processing Standard (FIPS) Publication 55-3) description of a GU as,

> A legally bounded geographic entity that has the ability to have elected or appointed officials and raise revenues through taxes.

In addition, the Standard accommodates other legal entities and adopts the ANSI X3.31 (FIPS Publication 55-3) description for such entities. Thus, this Standard defines a legal entity as,

> A geographic unit with legally defined boundaries established under federal, state, tribal, or local law as a governmental unit or as an area for the administration of some governmental function.

This standard also applies to entities that are statistically equivalent to a legal entity for data reporting purposes, e.g. incorporated places that are independent of counties and serve as equivalent to a county. GUs and other legal entities recognized by this Standard are defined in Annex E (normative). Principles described in this standard may be extended to other geographic entities to facilitate the exchange of boundary data, such as those listed in Annex F (informative).

The Standard specifies the content and its organization necessary for the successful interchange of GU or other legal entity boundary data. The Standard does not specify a particular structure for interchange of boundary data. Further, data producers and users may structure GU or other legal entity boundary data in any format for their internal use.

2.0 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

[1] ANSI X3.31-1988, *Information Systems-Codes-Structure for the Identification of the Counties and County Equivalents for the United States and its Outlying and Associated Areas for Information Interchange*

[2] ANSI X3.47-1988, *Information Systems-Codes-Structure and Data Requirements for the Identification of Named Populated Places, Primary County Divisions, and Other Locational Entities of the United States and Its Outlying and Associated Areas for Information Interchange*

[3] ANSI NCITS 320-1998, *Information Technology-Spatial Data Transfer*

[4] FGDC-STD-003-1999 *Cadastral Data Content Standard for the National Spatial Data Infrastructure*

[5] FGDC-STD-001-1998 *Content Standards for Digital Geospatial Metadata (Version 2.0)*

[6] FIPS 55-3 *Codes for Named Populated Places, primary County Divisions, and Other Locational Entities of the United States, Puerto Rico, and the Outlying Areas*

[7] FIPS 6-4 *Counties and Equivalent Entities of the United States, Its Possessions, and Associated Areas*

[8] ISO 19109 *Geographic Information-Rules for Application Schema (DIS)*

[9] ISO 19112 *Geographic Information-Spatial Referencing by Geographic Identifiers (DIS)*

3.0 Definitions and abbreviations

3.1 Definitions

3.1.1 areal – a term specifying that an object is two-dimensional

3.1.2 boundary – line defining the limits of a geographic entity

NOTE: A boundary may or may not follow a visible feature and may or may not be visibly marked.
In ISO 19107 boundary is "set that represents the limits of an entity".

3.1.3 bounded – the conditional relationship representing a GU or other legal entity contained within a continuous delimiting line or an ordered set of line segments

NOTE: Applicable at the type or instance level
In ISO 19107 bounded is "contained within a continuous delimiting line or an ordered set of line segments".

3.1.4 coextensive with – one-to-one areal maintenance relationship between two geographic entities or features

NOTE: Applicable at the instance level

3.1.5 coincident – a boundary shared by two or more different geographic entity types or a boundary and a feature having the same limits

3.1.6 contains nested – one-to-one or one-to-many areal maintenance relationship between a geographic entity or feature and others where nesting relationships are inherited

NOTE: A nesting relationship implies one geographic entity must be totally within another.
Applicable at the instance level

EXAMPLE: State of Delaware contains nested three counties.

3.1.7 contains only – one-to-many maintenance relationship between a geographic entity or feature and others where nesting relationships are inherited

NOTE: A "contains only" nesting relationship implies two or more geographic entities must be totally within another and exhaust all territory within the nested entity.
EXAMPLE: State of Delaware contains only three counties.

3.1.8 composes – the conditional relationship where the GU or other legal entity always forms a part of another feature

NOTE: Composes assumes a geographic entity is contained entirely within, or encompassed by, another. Applicable at the type or instance level

3.1.9 composed of – the conditional relationship where one or more topological or feature objects that always are the ingredients of the GU or legal entity

NOTE: Applicable at the type or instance level

3.1.10 conjoint – a boundary shared by two or more adjacent geographic areas

3.1.11 contiguous – descriptive of two areas that are adjacent to one another, touch at a common point, or share a boundary

3.1.12 functional status – the administrative or legal activities associated with performing the legally prescribed functions of a governmental unit; the administrative or legal entity is either functioning or non-functioning, is either active or inactive

3.1.13 governmental unit – a legally bounded geographic entity that has the ability to have elected or appointed officials and raise revenues through taxes

3.1.14 government unit boundary description component – element for identifying and storing discrete units of information on governmental unit boundaries

3.1.15 instance – single representation of a feature type

EXAMPLE: Corporate boundary of Augusta, Georgia

3.1.16 legal area – a geographic area whose boundaries, name, origin, and legal/statistical area description result from charters, laws, treaties, or other administrative or governmental action

3.1.17 legal entity – a geographic unit with legally defined boundaries established under federal, state, tribal, or local law as a governmental unit or as an area for the administration of a governmental function

3.1.18 maintenance relationship – common areal information that must be maintained between one or more geographic entities or features

NOTE: Applicable at the type and instance level

3.1.19 nests within – many-to-one areal maintenance relationship between geographic entities or features where an entity must be contained within another entity

NOTE: Applicable at the instance level

EXAMPLE: Counties nest within states.

3.1.20 non-bounded – the conditional relationship representing a GU or other legal entity lacking a delimiting line

NOTE: Non-bounded is the absence of being bounded. Applicable at the type or instance level

3.1.21 topological relationship – spatial condition or characteristic required for creating and maintaining the internal topology of a database (or file)

3.1.22 type – representation of a class of real world occurrences with common characteristics

3.2 Abbreviations

3.2.1 ANSI – American National Standards Institute

3.2.2 DIS – Draft International Standard

3.2.3 FIPS PUB – Federal Information Processing Standards Publication

3.2.4 FGDC – Federal Geographic Data Committee

3.2.5 GU – governmental unit

3.2.6 INCITS – InterNational Committee for Information Technology Standards

3.2.7 Metadata Standard – *Content Standards for Digital Geospatial Metadata (Version 2.0)* (FGDC-STD-001-1998)

3.2.8 NCITS – National Committee for Information Technology Standards

3.2.9 SDTS – *Spatial Data Transfer Standard* (FIPS-PUB-173-1992)

3.2.10 the Standard – Governmental Unit Boundary Data Exchange Standard

4.0 Standards development

The FGDC Subcommittee on Cultural and Demographic Data, sponsor of the Geographic Information Framework Data Content Standards-Governmental Unit Boundary Exchange Standard, initiated the development of the Governmental Unit Boundary Data Content Standard pursuant to the Office of Management and Budget (OMB) Circular A-16 that specifies governmental unit boundaries as one of the seven data themes that constitute the National Spatial Data Infrastructure (NSDI). Development commenced with the submittal of the "Proposal for a National Spatial Data Infrastructure Standards Project" to the FGDC Standards Working Group in November 1997. The proposal was accepted by the FGDC, and completed Public Review in April 1998 with favorable comments. The first version of the working draft was completed in February 1999. In August 2002, the FGDC determined that the development of the suite of seven data theme standards of the NSDI will continue under the auspices of INCITS L1. Thus, the review and affirmation of the Governmental Unit Boundary Exchange Standard will be through ANSI process.

5.0 Overview of governmental unit and other legal entity boundary data content

The purpose of this Standard is to establish the content requirements for the collection and interchange of governmental unit (GU) and other legal entity boundary data. To fully describe the GU or other legal entity boundary information, one must include references, GU type information, GU instance information, and GU boundary instance coordinate information.

5.1 References

When describing GU or other legal entity boundaries, the dataset must be documented by FGDC-compliant metadata in accordance with FGDC-STD-001-1998 *Content Standards for Digital Geospatial Metadata (Version 2.0).* Annexes to this National Standard describe the necessary reference

documentation. This reference metadata requires, for example, citation, project parameters, and data quality. In addition, one can record other documents referenced in documenting the boundary.

5.2 GU type information

GU type information describes the general category, or type, of GU or other legal entity being documented, e.g. county. This section of GU or other legal entity documentation includes GU type name, GU definition, coding system, if any, and relationship information to other GU type entities.

5.3 GU instance

GU instance relays specific information and coordinate data about the individual GU being described. This includes the instance name, instance relationships, and coordinates.

6.0 Governmental unit and other legal entity identification and relationship information

The exchange of GU boundary information requires that each GU be unambiguously identified and that the relationship of that GU to other GUs be clearly indicated.

6.1 Information

Information about GUs and other legal entities is presented at two levels: the *Type Level* (pertaining to categories of GUs or other legal entities), and the *Instance Level* (pertaining to single occurrences of a GU or other legal entity).

6.2 Identification

Identification information is essential for describing GU and other legal entity boundaries. Identification information is applicable at both the *Type Level* and the *Instance Level*. Examples of identification information at the type level are type name and type definition. Examples of identification information at the instance level are instance name and legal area description.

6.3 Relationships

Equally important for describing GUs and other legal entities is knowledge of their relationships to other entities. Relationships between GUs are topologic relationships and maintenance relationships.

6.3.1 Topologic relationships

Topologic relationships describe how a GU relates to its neighbors, or how it fits within a hierarchy. Topologic relationships identified in this standard are contiguous, composed of, composes. Topologic relationships are applicable at the type level and instance level. They may include relationships required for the internal topology of a database.

6.3.2 Maintenance relationships

Maintenance relationships, if they exist for GUs or other legal entities, provide the dependencies of common areal information between one or more GUs or other legal entity boundaries and geographic area features of which they consist. Maintenance relationships are applicable at the Type Level and Instance Level. Maintenance relationships describe the dependencies between one GU and another. This standard recognizes four maintenance relationships: coextensive with, contains nested, nests within, and contains only nested. An example of a maintenance relationship is “Arlington County coextensive with Arlington Minor Civil Division coextensive with Arlington Census Designated Place.” Coincidental

relationships or relationships which do not require maintenance are excluded.

The following are the recognized maintenance relationships, their properties, and the required maintenance actions.

6.3.2.1 Coextensive with

A one-to-one areal maintenance relationship between two geographic entities or features.

Properties: If A is coextensive with B, then B is coextensive with A.
If A is coextensive with B and B is coextensive with C, then A is coextensive with C.
Maintenance: If A is coextensive with B, then any change to A results in an equal change to B.

6.3.2.2 Contains nested

A one-to-one or one-to-many areal maintenance relationship between a geographic entity or feature where nesting relationships are inherited.

Properties: If A contains nested B and C, then B nests within A and C nests within A.
Maintenance: If A contains nested B and C, then any change to A results in an equal change to B or C or both if the change occurs at a shared boundary.

6.3.2.3 Nests within

A many-to-one areal maintenance relationship between different features

Properties: If B nests within A, then A contains nested B and contains at least one other entity of the same type feature.
Maintenance: If B nests within A, then any areal change to B along a shared boundary segment with A results in an equal change to A.

6.3.2.4 Contains only nested

A one-to-many areal relationship between different objects where the nested objects comprise the nesting object. (All entities nest within.)

Properties: If B nests within A, then A contains nested B and contains at least one other entity of the same type feature.
Maintenance: If B nests within A, then any areal change to B adding territory from or deleting territory to another feature that does not nest within A, results in an equal change to A.
Note: The Contains Only Nested relationship is a more restrictive subset of the Contains Nested relationship and implies complete coverage of the nesting object. For example, a city may legally only exist in a single township but not completely cover the township. Any boundary change to the city where the city shares a boundary with the township requires a boundary change to the township, but boundary changes to the city internal to the township will not affect the township boundary. A change to the township boundary only requires a change to the city boundary if the change is along a shared boundary segment and would result in placing a part of the city outside the township (a diminishing of the township). A Contains Only relationship exists for all townships in a county. Any change to the county boundary requires a change to one or more township boundaries and any change to a township boundary along a shared boundary segment with the county requires a change to the county boundary. This is a simple contains nested relationship.

7.0 Data content of governmental unit and other legal entity boundaries

7.1 Description of a governmental unit

There are many variations to the definition of a governmental unit. Because of these variations, geographic entities recognized as GUs by one organization may not be acknowledged as GUs by other organizations. Section 1.0 of this National Standard contains the ANSI (FIPS) definition of a governmental unit. The requirements to be compliant with this standard depend upon whether or not the entity being described fits the definition of a GU.

Annex C (normative) provides specific definitions of GUs and other legal entities that are applicable to the Standard. The table is included in the Standard for informational purposes to aid organizations in identifying their GUs and other legal entities and should not be considered an exhaustive listing of GUs and other legal entities.

Annex E (informative) provides an additional list of other entities for which the Standard can be applied to facilitate the exchange of boundary information.

7.2 Governmental unit and other legal entity boundary dataset element characteristics

Annex A (normative) provides the data model for governmental unit data exchange. The UML model encompasses all mandatory components used to identify, describe, and store the information required for exchanging GU and other legal entity boundary information. Annex B (normative) provides all entity and attribute definitions, domains, obligations/conditions, maximum occurrences, and data types for elements depicted in the Governmental Unit boundary UML model.

Annex D (informative) provides examples of the information that would be communicated when exchanging GU boundary information in accordance with the UML data model in Annex A (normative). The examples describe the Delaware state boundary as a curve set and the three Delaware counties as a polygon set. FGDC compliant metadata is also provided.

Additionally, GU boundary dataset description components are depicted in informative annexes as a graphic illustration in Annex G (informative) and with more detail as a table in Annex H (informative). In these annexes, the GU boundary dataset is composed of three types of components: reference component, type information component, and instance component. Each of the major sections contains subsections, some of which may be further subdivided.

7.2.1 GU boundary dataset description characteristics

GU Boundary Description Components are defined by six characteristics:

7.2.1.1 Component Name

A label assigned to the GU Boundary Description Component

7.2.1.2 Component Definition

The GU Boundary Description Component description

7.2.1.3 Component Domain

Specification of the set of distinct values for each GU Boundary Description Component

7.2.1.4 Obligation/Condition (O/C)

A descriptor assigned to a GU Boundary Description Component that indicates the necessity of its

inclusion in boundary information exchange. The obligation determines whether the component shall always be present (contain values), or be present according to established conditions. The descriptor may have the following values:

Mandatory (M) The GU Boundary Description Component shall be present in all cases, i.e., is required.

Conditional (C) The GU Boundary Description Component shall be present if the condition(s) assigned to the component is met.

Optional (O) The GU Boundary Description Component may be present or not. Optional GU Boundary Description Components have been defined to provide a means to those seeking to more fully document their GU Boundary exchange file.

7.2.1.5 Maximum occurrences (MO)

The number of instances a GU Boundary Description Component may have.

7.2.1.6 Data type

Identifies the set of distinct values for representing GU Boundary Description Components (for example: text, integer number, real number, or date)

8.0 Governmental unit boundary file metadata requirement

The Standard is compliant with the FGDC Content Standard for Digital Geospatial Metadata v. 2.0. The numbers preceding the metadata elements indicate the location of the definition within the Metadata Standard. This section is an overview of the mandatory metadata elements in the Metadata Standard. Annex F (informative) specifies the information necessary when documenting metadata for the Governmental Unit Boundary Exchange Standard.

The following metadata elements are all relevant compound elements and mandatory elements. Each element is followed by an explanatory statement.

1.0 Identification information–basic information about the data set
- 1.1 Citation – information to be used to reference the data set
- 1.2 Description – a characterization of the data set, including its intended use and limitations
- 1.3 Time Period of Content – time period(s) for which the data set corresponds to the currentness reference
- 1.4 Status – the state of and maintenance of information for the data set
- 1.5 Spatial Domain – the geographic areal domain of the data set
- 1.6 Keywords – words or phrases summarizing an aspect of the data set
- 1.7 Access Constraints – restrictions and legal prerequisites for accessing the data set. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data set.
- 1.8 Use Constraints – restrictions and prerequisites for using the data set after access is granted. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the data set.

2.0 Data Quality Information – a general assessment of the quality of the data set

4.0 Spatial Reference Information – the description of the reference frame for, and the means to encode, coordinates in the data set

5.0 Entity and Attribute Information – details about the information content of the data set, including the entity types, their attributes, and the domains from which attribute values may be assigned.

6.0 Distribution Information – information about the distributor of and options for obtaining the data set

7.0 Metadata Reference Information – information on the currentness of the metadata information, and the responsible party
- 7.1 Metadata Date – the date that the metadata were created or last updated

7.4 Metadata Contact – the party responsible for the metadata information
7.5 Metadata Standard Name – the name of the metadata standard used to document the data set
7.6 Metadata Standard Version – identification of the version of the metadata standard used to document the data set

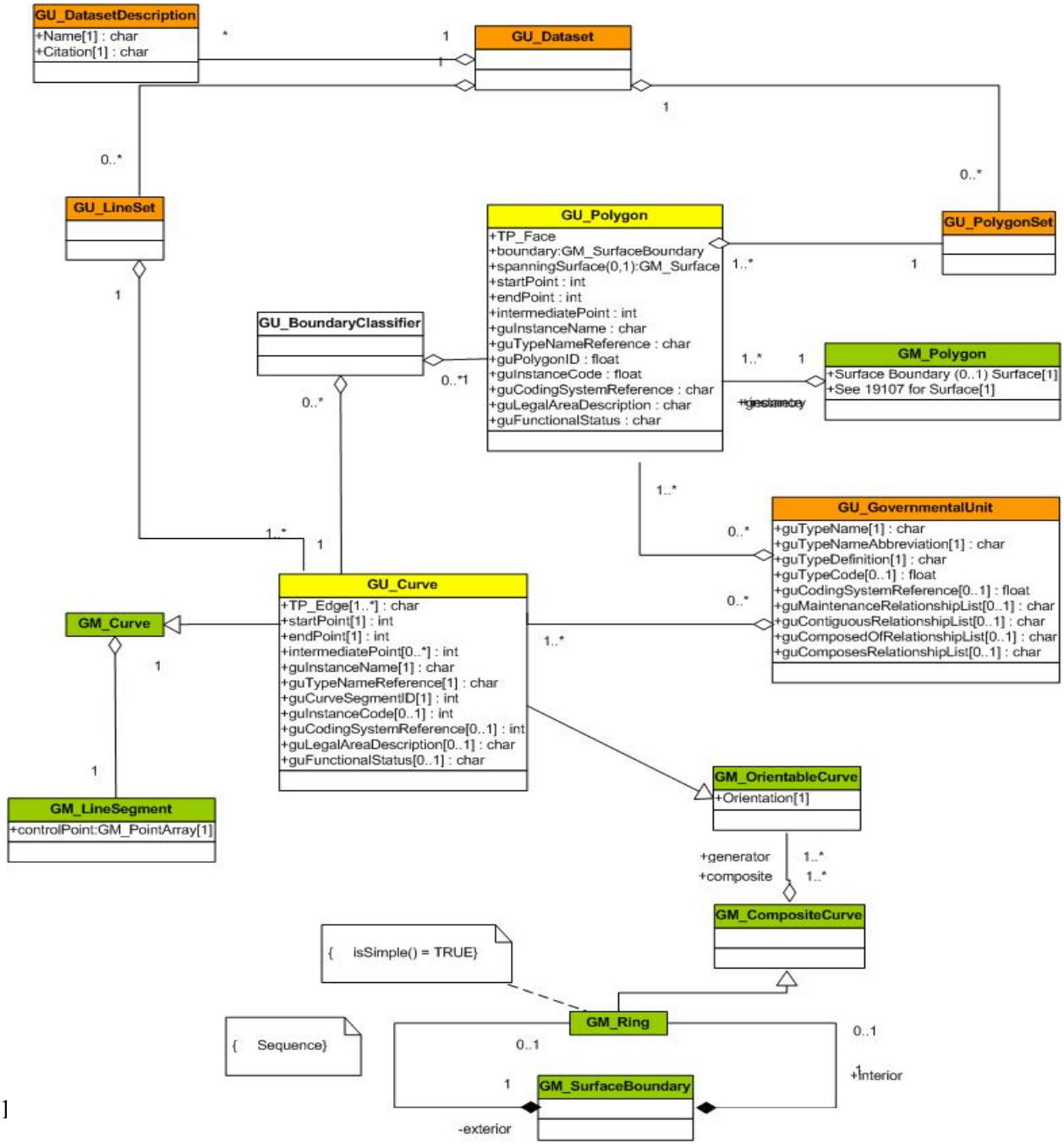
9.0 Maintenance authority

The U.S. Department of Commerce, Census Bureau, Geography Division, maintains the Geographic Information Framework Data Content Standard-Governmental Unit Boundary Data Exchange Standard. Address any questions to Chief, Geography Division, U.S. Bureau of the Census.

Annex A
(normative)

Governmental unit boundary UML model

Annex A (normative) provides the data model for data exchange. The information required for exchanging GU and other legal entity boundary data is described in the following abstract object model in Unified Modeling Language (UML). Annex B (normative) provides the definitions, domains, obligation/condition, maximum occurrence, and data type for each object and attribute depicted in the GU Boundary Information UML. This model is a tool to aid in understanding the elements necessary for boundary data exchange.



Annex B
(normative)

Governmental unit boundary UML object description

Annex B (normative) describes the object and attribute information necessary to exchange GU and other legal entity boundary data. This table provides reference information about the objects and attributes in Annex A (normative). Definitions for the terminology describing the characteristics of the data are provided in 7.2.

To implement Annex B, one shall follow the UML diagram in Annex A and use the following table as a reference for these objects and attributes. Follow the Line numbers in sequence and consult the Obligation/Condition (O/C) to determine if the component is mandatory (M), conditional (C) and its conditions are met, or if it is optional (O). Once it is determined that the component is required for GU boundary documentation through its definition and obligation/condition, one shall refer to the domain which describes the valid values that can be assigned to the data element. If the component is a compound element, the domain will specify the lines of data elements to include. If the component is a compound element, the line will be blue, the domain will specify the appropriate lines for the component, and the data type will specify 'compound'. For data elements the characteristic "data type" describes the kind of value to be provided, e.g. integer, real, text. The maximum occurrence (MO) will specify if the element shall only be recorded one time (1) or if the element is repeatable from one to many times (*).

B.1 GU_Dataset

Line #	Name	Definition	Obligation	MO	Data Type	Domain
1	GU_Dataset	Set of GU type, instance, and boundary information to be exchanged.	M	1	Class	Lines 1-4
2	RN GU_DatasetDescription	Association between GU_Dataset and GU_DatasetDescription	M	1	Association	GU_DatasetDescription
3	RN GU_LineSet	Association between GU_Dataset and GU_LineSet	C/ if the boundary consists of a set of curves	0..*	Association	GU_LineSet
4	RN GU_PolygonSet	Association between GU_Dataset and GU_PolygonSet	C/ if the boundary consists of a set of polygons	0..*	Association	GU_PolygonSet

B.1.1 GU_DatasetDescription

Line #	Name	Definition	Obligation	MO	Data Type	Domain
5	GU_DatasetDescription	Description of the dataset	M	1	Class	Lines 5-7

6	Name	Identification of the dataset	M	1	CharacterString	Free text
7	Citation	Description of the purpose and content of the dataset.	M	1	CharacterString	Free text

B.1.2 GU_LineSet

Line #	Name	Definition	Obligation	MO	Data Type	Domain
8	GU_LineSet	Set of curves that define the GU boundary being described	C/if the boundary consists of one or more curves	1	Class	Lines 8-9
9	RN GU_Curve	Association between GU_LineSet and GU_Curve	M	1..*	Association	GU_Curve

B.1.2.1 GU_Curve

Line #	Name	Definition	Obligation	MO	Data Type	Domain
10	GU_Curve	Set of coordinates with no repetition that define a curve	C/if the boundary consists of one or more curves	1..*	Class	Lines 10-26
11	RN GM_Curve	Defined in ISO 19107	M	0..1	Association	GM_Curve
12	GM_Curve(segment[1..*]: GM_CurveSegment):GM_Curve	Defined in ISO 19107	M	1		
13	GM_OrientableCurve	Defined in ISO 19107	M	0..*	Class	Lines 13-14
14	boundary ():GM_CurveBoundary	Defined in ISO 19107	M	1		
15	RN GU_GovernmentalUnit	Association between GU_Curve and GU_GovernmentalUnit	M	1..*	Association	GU_GovernmentalUnit
16	TP_Edge	Defined in ISO 19107	M	1..*		
17	startPoint	First point of a curve	M	1	Integer	Free number
18	endPoint	Last point of a curve	M	1	Integer	Free number
19	intermediatePoint	Point on a curve	C / if one or more intermediate points exist	1..*	Integer	Free number
20	guInstanceName	Identification of the single representation of the feature type, or specific GU described	M	1	CharacterString	Free Text
21	guTypeNameReference	Reference to the GU type name	M	1	CharacterString	Free text
22	guCurveSegmentID	Specific identifier assigned to the GU boundary polygon	M	1..*	CharacterString/Integer	Free text, free number

23	guInstanceCode	Specific code which identifies the GU instance being described	C/if an instance code exists	0..1	CharacterString/Integer	Free text, free number
24	guCodingSystemReference	GU Type Code reference	C/if a type code exists	0..1	CharacterString/Integer	Free text
25	guLegalAreaDescription	Description of the legal area, a geographic area whose boundaries, name, origin, and legal/statistical area description result from charters, laws, treaties, or other administrative or governmental action	C/ if legal area description is known	0..1	CharacterString	Free text
26	guFunctionalStatus	Administrative or legal activities associated with performing the legally prescribed functions of a governmental unit	C/ if functional status is known	0..1	CharacterString	nonfunctioning, active, inactive

B.1.2.1.1 GM_LineSegment

Line #	Name	Definition	Obligation	MO	Data Type	Domain
27	GM_LineSegment	Defined in ISO 19107	M	1	Class	Lines 27-28
28	controlPoint:GM_Point Array	Defined in ISO 19107	M	1		

B.1.2.1.2 GM_CompositeCurve

Line #	Name	Definition	Obligation	MO	Data Type	Domain
29	GM_CompositeCurve	Defined in Defined in ISO 19107	M	1	Class	Lines 29-30
30	RN GM_Ring	Association between GM_CompositeCurve and GM_Ring	M	1	Association	GM_Ring

B.1.2.1.2.1 GM_Ring

Line #	Name	Definition	Obligation	MO	Data Type	Domain
31	GM_Ring	Defined in ISO 19107	M	1	Class	Lines 31-34
32	RN GM_SurfaceBoundary	interior, exterior	M	1	Association	GM_SurfaceBoundary
33	{ isSimple () = TRUE}	Defined in ISO 19107	M	1	Note	
34	{Sequence}	Defined in ISO 19107	M	1	Note	

B.1.2.1.2.1.1 GM_SurfaceBoundary

Line #	Name	Definition	Obligation	MO	Data Type	Domain

35	GM_SurfaceBoundary	Defined in ISO 19107	M	1	Class	Line 35

B.1.2.1.3 GU_BoundaryClassifier

Line #	Name	Definition	Obligation	MO	Data Type	Domain
36	GU_BoundaryClassifier	A term or phrase which describes the status of the boundary.	C/ if one or more boundary classifiers exist	0..*	CharacterString	Free text

B.1.2.1.4 GU_GovernmentalUnit

Line #	Name	Definition	Obligation	MO	Data Type	Domain
37	GU_GovernmentalUnit	The GU being documented.	M	1..*	Class	Lines 37-49
38	guTypeName	The designated name for the type of GU whose data are being described	M	1	CharacterString	Annex C, free text
39	guTypeNameAbbreviation	The abbreviated name for the type of GU whose data are being described	C/ if an abbreviation exists for GU Type Name	1	CharacterString	Free text
40	guTypeDefinition	Definition of the type of GU whose data are being described	C/ if type definition is known	1	CharacterString	Annex C, free text
41	guTypeCode	The specific code which identifies the GU being described	C/ if a type code exists	0..*	CharacterString/ Integer	Free number
42	guCodingSystemReference	GU Type Code reference documentation	M	0..*	CharacterString/ Integer	FIPS code, free text, free number
43	guMaintenanceRelationshipList	List of maintenance relationships, common areal information between one or more GUs or legal entities and geographic area features, for the GU type being described	C/ if one or more maintenance relationships exist	0..*	CharacterString	Free text
44	guContiguousRelationshipList	List of GUs or feature objects that are either adjacent to one another, touch at a common point, or share a boundary	C/ if one or more contiguous relationships exist	0..*	CharacterString	Free text
45	guComposedOfRelationshipList	List of GUs or feature objects that constitute the GU being documented	C/ if one or more composed of relationships exist	0..*	CharacterString	Free text
46	guComposesRelationshipList	List of GUs of which the GU being documented always forms a part	C/if one or more composes relationships exist	0..*	CharacterString	Free text

47	guContiguousRelationshipList	List of GUs or feature objects that are either adjacent to one another, touch at a common point, or share a boundary	C/ if one or more contiguous relationships exist	0..*	CharacterString	Free text
48	guComposedOfRelationshipList	List of GUs or feature objects that constitute the GU being documented	C/ if one or more composed of relationships exist	0..*	CharacterString	Free text
49	guComposesRelationshipList	List of GUs of which the GU being documented always forms a part	C/ if one or more composes relationships exist	0..*	CharacterString	Free text

B.1.3 GU_PolygonSet

Line #	Name	Definition	Obligation	MO	Data Type	Domain
50	GU_PolygonSet	Set of one or more polygons that define a GU boundary being described.	C/ if the boundary consists of one or more polygons	1	Class	Lines 50-51
51	RN GU_Polygon	Association between GU_PolygonSet and GU_Polygon	M	1	Association	GU_Polygon

B.1.3.1 GU_Polygon

Line #	Name	Definition	Obligation	MO	Data Type	Domain
52	GU_Polygon	Set of line segments that define a GU boundary being described.	C/ if the boundary consists of one or more polygons	1..*	Class	Lines 52-67
53	RN GM_Polygon	Defined in ISO 19107	M	1	Association	GM_Polygon
54	TP_Face	Defined in ISO 19107	M	1		
55	boundary:GM_SurfaceBoundary	Defined in ISO 19107	M	1		
56	spanningSurface(0,1):GM_Surface	Defined in ISO 19107	M	1		
57	RN GU_GovernmentalUnit	Association between GU_polygon and GU_GovernmentalUnit	M	0..1	Association	GU_GovernmentalUnit
58	startPoint	First point of a curve	M	1	Integer	Free number
59	endPoint	Last point of a curve	M	1	Integer	Free number
60	intermediatePoint	Point on a curve	C / if one or more intermediate points exist	1..*	Integer	Free number
61	guInstanceName	Identification of the single representation of the feature type, or specific GU described	M	1	CharacterString	Free text

62	guTypeNameReference	Reference to the GU type name	M	1	CharacterString	Free text
63	guPolygonID	Specific identifier assigned to the GU boundary polygon	M	1..*	CharacterString/Integer	Free text/free number
64	guInstanceCode	Specific code which identifies the GU instance being described	C/ if an instance code exists	0..1	CharacterString/Integer	Free text/free number
65	guCodingSystemReference	GU Type Code reference	M	0..1	CharacterString/Integer	Free text
66	guLegalAreaDescription	Description of the legal area, a geographic area whose boundaries, name, origin, and legal/statistical area description result from charters, laws, treaties, or other administrative or governmental action	C/if legal area description is known	0..1	CharacterString	Free text
67	guFunctionalStatus	Administrative or legal activities associated with performing the legally prescribed functions of a governmental unit	C/ if functional status is known	0..1	CharacterString	nonfunctioning, active, inactive

B.1.3.1.1 GU_BoundaryClassifier

Line #	Name	Definition	Obligation	MO	Data Type	Domain
68	GU_BoundaryClassifier	A term or phrase which describes the status of the boundary.	C/ if one or more boundary classifiers exist	0..*	CharacterString	Free text

B.1.3.1.2 GM_Polygon

Line #	Name	Definition	Obligation	MO	Data Type	Domain
69	GM_Polygon	Defined in ISO 19107	M	1		Lines 69-71
70	Surface Boundary	Defined in ISO 19107	M	1		
71	Surface	Defined in ISO 19107	M	1		

B.1.3.1.3 GU_GovernmentalUnit

Line #	Name	Definition	Obligation	MO	Data Type	Domain
72	GU_GovernmentalUnit	The GU being documented.	M	1..*	Class	Lines 72-84
73	guTypeName	The designated name for the type of GU whose data are being described	M	1	CharacterString	Annex C, free text

74	guTypeNameAbbreviation	The abbreviated name for the type of GU whose data are being described	C/ if an abbreviation exists for GU Type Name	1	CharacterString	Free text
75	guTypeDefinition	Definition of the type of GU whose data are being described	C/ if type definition is known	1	CharacterString	Annex C, free text
76	guTypeCode	The specific code which identifies the GU being described	C/ if a type code exists	0..*	CharacterString/ Integer	Free number
77	guCodingSystemReference	GU Type Code reference documentation	M	0..*	CharacterString/ Integer	FIPS code, free text, free number
78	guMaintenanceRelationshipList	List of maintenance relationships, common areal information between one or more GUs or legal entities and geographic area features, for the GU type being described	C/ if one or more maintenance relationships exist	0..*	CharacterString	Free text
79	guContiguousRelationshipList	List of GUs or feature objects that are either adjacent to one another, touch at a common point, or share a boundary	C/ if one or more contiguous relationships exist	0..*	CharacterString	Free text
80	guComposedOfRelationshipList	List of GUs or feature objects that constitute the GU being documented	C/ if one or more composed of relationships exist	0..*	CharacterString	Free text
81	guComposesRelationshipList	List of GUs of which the GU being documented always forms a part	C/if one or more composes relationships exist	0..*	CharacterString	Free text
82	guContiguousRelationshipList	List of GUs or feature objects that are either adjacent to one another, touch at a common point, or share a boundary	C/ if one or more contiguous relationships exist	0..*	CharacterString	Free text
83	guComposedOfRelationshipList	List of GUs or feature objects that constitute the GU being documented	C/ if one or more composed of relationships exist	0..*	CharacterString	Free text
84	guComposesRelationshipList	List of GUs of which the GU being documented always forms a part	C/ if one or more composes relationships exist	0..*	CharacterString	Free text

Annex C
(normative)

Governmental unit and other legal entity definitions

Annex C (normative) provides definitions of legal GUs and other legal areas that are generally recognized.

C.1 Alaska Native Regional Corporation (ANRC)

Corporate entity established to conduct both business and nonprofit affairs of Alaska Native pursuant to the Alaska Native Claims Settlement Act of 1972 (Public Law 92-203). Twelve ANRCs are geographic entities that cover most of the state of Alaska (the Annette Islands Reserve–an American Indian reservation–is excluded from any ANRC). (A thirteenth ANRC represents Alaska Natives who do not live in Alaska and do not identify with any of the 12 corporations).
Entity type: Legal

C.2 Alaska Native Village

Alaska Native Village is defined in section 3 of Public Law 92-203 to mean any tribe, band, clan, group, village, community, or association in Alaska listed in section 11 and 16 in this Act, or which meets the requirements of this Act, and which the Secretary *of the Interior* determines was, on the 1970 census enumeration date (as shown by the census or other evidence satisfactory to the Secretary, who shall make findings of fact in each instance), composed of twenty-five or more Natives.
Entity type: Legal

C.3 American Indian Reservation

Federal American Indian reservations are areas that have been set aside by the United States for the use of tribes. The exterior boundaries of which are more particularly defined in the final tribal treaties, agreements, executive orders, federal statutes, secretarial orders, or judicial determinations. These entities are known as colonies, communities, pueblos, rancherias, ranches, reservations, reserves, villages, Indian communities, and Indian villages. The Bureau of Indian Affairs maintains a list of federally recognized tribal governments. Some state governments have established reservations for tribes recognized by the state.
Entity Type: GU

C.4 American Indian Tribal Subdivision

American Indian Tribal Subdivisions are administrative subdivisions of federally recognized American Indian reservations, off-reservation trust lands, or Oklahoma tribal statistical areas (OTSAs), known as areas, chapters, communities, or districts. These entities are internal units of self-government or administration that serve social, cultural, and/or economic purposes for the American Indians on the reservations, off-reservation trust lands or OTSAs.
Entity Type: Legal

C.5 American Indian Trust Land

Trust lands are areas for which the United States holds title in trust for the benefit of a tribe (tribal trust land) or for an individual Indian (individual trust land.) Trust lands can be alienated or encumbered only by the owner with the approval of the Secretary of the Interior or his/her authorized representative. Trust lands may be located on or off of a reservation.
Entity Type: GU (either alone or in combination with an associated American Indian Reservation)

C.6 Borough

Boroughs are legally established geographic entities in Alaska, minor civil divisions in each of the five counties that comprise New York city, and a type of incorporated place in Connecticut, New Jersey, and Pennsylvania.
Entity Type: Legal

C.7 City

A type of incorporated place in 49 States and the District of Columbia
Entity Type: GU

C.8 Congressional district

Congressional districts (CDs) are the 435 areas from which people are elected to the U.S. House of Representatives. After the apportionment of congressional seats among the states, based on census population counts, each state is responsible for establishing CDs for the purpose of electing representatives. Each CD is to be as equal in population to all other CDs in the state as practical.
Entity Type: Legal

C.9 Consolidated City

A consolidated government is a unit of local government for which the functions of an incorporated place and its county or minor civil division (MCD) have merged. The legal aspects of this action may result in both the primary incorporated place and the county or MCD continuing to exist as legal entities, even though the county or MCD performs few or no governmental functions and has few or no elected officials. Where this occurs, and where one or more other incorporated places in the county or MCD continue to function as separate governments, even though they have been included in the consolidated government, the primary incorporated place is referred to as a consolidated city.
Entity Type: GU

C.10 County or equivalent legal entity

The primary legal divisions of most states are termed “counties.” In Louisiana, these divisions are known as parishes. In Alaska, which has no counties, the statistically equivalent entities are census areas, city and boroughs (as in Juneau City and Borough), a municipality (Anchorage), and organized boroughs. In four states (Maryland, Missouri, Nevada, and Virginia), there are one or more incorporated places that are independent of any county organization and thus constitute primary divisions of their states; these incorporated places are known as “independent cities”. The District of Columbia has no primary division. In American Samoa, the primary divisions are districts and islands. In the Northern Mariana Islands, the primary subdivision is municipalities. In Puerto Rico, the primary subdivision is municipios. In the Virgin Islands, the principal islands of St. Croix, St. John, and St. Thomas are the division. Guam has no primary divisions.
Entity Type: GU

C.11 County subdivision

County subdivisions are the primary divisions of counties and statistically equivalent entities for data presentation purposes. They include census county divisions, census subareas, minor civil divisions (MCDs), unorganized territories, and incorporated places that are independent of any MCD. In Puerto Rico, Barrio and Barrio-Pueblo are legal subdivisions of a municipio.
Entity Type: Legal

C.12 Hawaiian Home Land

Hawaiian Home Lands are areas held in trust for native Hawaiians by the state of Hawaii, pursuant to the Hawaiian Homes Commission Act of 1920, as amended.
Entity Type: Legal

C.13 Incorporated Place

Incorporated places are legally established in each state, under the laws of their respective states. Some examples are cities, boroughs, city and borough, municipalities, towns, and villages. In four states (Maryland, Missouri, Nevada, and Virginia), there are one or more incorporated places known as "independent cities" that are primary subdivisions of a state and legally not part of any county.
Entity Type: GU and legal

C.14 Minor Civil Division

Minor civil divisions (MCDs) are the primary governmental or administrative divisions of a county in many states (parish in Louisiana). They represent many different kinds of legal entities with a wide variety of governmental and/or administrative functions. Some examples of MCDs are assessment districts, charter townships, gores, grants, locations, magisterial districts, road districts, and townships.
Entity Type: GU and Legal

C.15 Municipality

Municipalities are legally established entities in Alaska and the Northern Mariana Islands.
Entity Type: Legal

C.16 Sub-Minor Civil Division

Sub-Minor Civil Divisions (Sub-MCDs) are second-order subdivision of counties and equivalent entities, for example, subbarios in Puerto Rico.
Entity Type: Legal

C.17 Special district

Special district governments are independent, special-purpose governmental units (other than school district governments) that exist as separate entities with substantial administrative and fiscal independence from general-purpose local governments. Special district governments provide specific services that are not being supplied by existing general purpose governments. Most perform a single function, but in some instances, their enabling legislation allows them to provide several, usually related, types of services.
Entity Type: Legal

C.18 States and equivalent entities

States are the primary governmental divisions of the United States. The District of Columbia is treated as a statistical equivalent of a state. Some federal agencies also treat a number of entities that are not legal divisions of the United States as statistically equivalent to a state: American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, and the Virgin Islands of the United States.
Entity Type: GU

C.19 State legislative district

State legislative districts (SLDs) are the areas from which members are elected to state legislatures. The SLDs embody the upper (senate) and lower (house) chambers of the state legislature.

Entity Type: Legal

C.20 Subbario

Subbarrios are legal subdivisions of Barrio and Barrio-Pueblo. Subbarrios in 23 municipios are the primary legal subdivisons of the barrio-pueblo and some barrios. There are no geographic entities in the United States equivalent to the subbarrio.
Entity Type: Legal

C.21 Town

A type of functioning minor civil division found in the New England states, New York, and Wisconsin; a type of incorporated place in 30 states and the Virgin Islands of the United States.
Entity Type: GU

C.22 Village

A type of incorporated place in 20 States and American Samoa.
Entity Type: GU

Annex D
(informative)

Governmental unit boundary encoding example

Annex D (informative) provides examples of the information that would be provided when exchanging GU boundary information. Example D.1 documents how one could exchange Delaware state boundary information as a set of curves and example D.2 documents a similar exchange, but for the three Delaware counties as a set of polygons. FGDC compliant metadata applicable for both examples D.1 and D.2 is provided in D.3. The metadata in D.3 is entered only one time because it is the same for both examples. The examples and metadata are presented as flat ASCII files. Spaces between lines are for readability only.

NOTE: This annex is for illustrative purposes only; the actual encoding of governmental unit boundary information depends upon the application.

D.1 Delaware state curve example
This is an example of encoding a single entity whose boundary is defined by a series of curve segments. For this example, the coastline is considered the state boundary.

GU_Dataset:
GU_DatasetDescription:
Name: Example_curve.txt
Citation: Example of how to encode a boundary of a single entity defined by a series of curve segments.

GU_LineSet:
GU_Curve:
startPoint: -75.79, 39.72
intermediatePoint [2]:
-75.76, 39.30
-75.72, 38.83
endPoint: -75.70, 38.46
guInstanceName: Delaware
guTypeNameReference: State
guCurveSegmentID: 1
guInstanceCode: 10
guCodingSystemReference: FIPS State Code
guFunctionalStatus: active

GU_Curve:
startPoint: -75.70, 38.46
endPoint: -75.04, 38.45
guInstanceName: Delaware
guTypeNameReference: State
guCurveSegmentID: 2
guInstanceCode: 10
guCodingSystemReference: FIPS State Code
guFunctionalStatus: active

GU_Curve:
startPoint: -75.04, 38.45
endPoint: -75.08, 38.80
guInstanceName: Delaware

guTypeNameReference: State
guCurveSegmentID: 3
guInstanceCode: 10
guCodingSystemReference: FIPS State Code
guFunctionalStatus: active

GU_Curve:
startPoint: -75.08, 38.80
intermediatePoint[10]:
-75.19, 38.81
-75.31, 38.94
-75.32, 39.01
-75.40, 39.07
-75.40, 39.25
-75.52, 39.36
-75.59, 39.46
-75.56, 39.57
-75.61, 39.61
-75.48, 39.72
endPoint: -75.41, 39.79
guInstanceName: Delaware
guTypeNameReference: State
guCurveSegmentID: 4
guInstanceCode: 10
guCodingSystemReference: FIPS State Code
guFunctionalStatus: active

GU_Curve:
startPoint: -75.41, 39.79
intermediatePoint[4]:
-75.48, 39.82
-75.58, 39.40
-75.66, 39.83
-75.73, 39.78
endPoint: -75.79, 39.72
guInstanceName: Delaware
guTypeNameReference: State
guCurveSegmentID: 5
guInstanceCode: 10
guCodingSystemReference: FIPS State Code
guFunctionalStatus: active

GU_GovernmentalUnit:
guTypeName: State
guTypeNameAbbreviation: ST
guTypeDefinition: States are the primary governmental divisions of the United States. The District of Columbia is treated as a statistical equivalent of a state. Some federal agencies also treat a number of entities that are not legal divisions of the United States as statistically equivalent to a state: American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, and the Virgin Islands of the United States.
guCodingSystemReference: FIPS State Code
guContiguousRelationshipList[5]:
curve segment 1 and Maryland State Boundary
curve segment 2 and Maryland State Boundary
curve segment 3 and Atlantic Ocean

curve segment 4 and Delaware Bay
curve segment 5 and Pennsylvania State Boundary

D.2 Delaware counties polygon example

This is an example of encoding multiple entities whose boundaries are defined by polygons. For this example, the coastline is the county boundary.

GU_Dataset:
GU_DatasetDescription:
Name: Example_polygon.txt
Citation: Example of how to encode a boundary of multiple entities defined by polygons.

GU_PolygonSet:
GU_Polygon:
startPoint: -75.79, 39.72
intermediatePoint[15]:
-75.76, 39.30
-75.70, 39.30
-75.66, 39.29
-75.61, 39.31
-75.56, 39.34
-75.52, 39.36
-75.59, 39.46
-75.56, 39.57
-75.61, 39.61
-75.48, 39.72
-75.41, 39.79
-75.48, 39.82
-75.58, 39.40
-75.66, 39.83
-75.73, 39.78
endPoint: -75.79, 39.72
guInstanceName: New Castle
guTypeNameReference: County
guPolygonID: N
guInstanceCode: 10003
guCodingSystemReference: FIPS State and County Code
guFunctionalStatus: active

GU_GovernmentalUnit:
guTypeName: County
guTypeNameAbbreviation: CO
guTypeDefinition: The primary legal divisions of most states are termed “counties.” In Louisiana, these divisions are known as parishes. In Alaska, which has no counties, the statistically equivalent entities are census areas, city and boroughs (as in Juneau City and Borough), a municipality (Anchorage), and organized boroughs. In four states (Maryland, Missouri, Nevada, and Virginia), there are one or more incorporated places that are independent of any county organization and thus constitute primary divisions of their states; these incorporated places are known as “independent cities”. The District of Columbia has no primary division. In American Samoa, the primary divisions are districts and islands. In the Northern Mariana Islands, the primary subdivision is municipalities. In Puerto Rico, the primary subdivision is municipios. In the Virgin Islands, the principal islands of St. Croix, St. John, and St. Thomas are the division. Guam has no primary divisions.

guCodingSystemReference: FIPS State and County Code
guMaintenanceRelationshipList[1]:
Nests within state of Delaware
guContiguousRelationshipList[5]:
County boundary and Delaware River
County boundary and Pennsylvania state boundary
County boundary and Delaware Bay
County boundary and Kent county boundary
County boundary and Maryland state boundary

GU_Polygon:
startPoint: -75.76, 39.30
intermediatePoint[11]:
-75.72, 38.83
-75.62, 38.83
-75.52, 38.86
-75.45, 38.91
-75.40, 38.93
-75.39, 38.95
-75.31, 38.94
-75.32, 39.01
-75.40, 39.07
-75.40, 39.25
-75.52, 39.36
endPoint: : -75.76, 39.30
guInstanceName: Kent
guTypeNameReference: County
guPolygonID: K
guInstanceCode: 10001
guCodingSystemReference: FIPS State and County Code
guFunctionalStatus: active

GU_GovernmentalUnit:
guTypeName: County
guTypeNameAbbreviation: CO
guTypeDefinition: Same as guPolygonID: N
guCodingSystemReference: FIPS State and County Code
guMaintenanceRelationshipList[1]:
Nests within the state of Delaware
guContiguousRelationshipList[4]:
County boundary and Maryland state boundary
County boundary and New Castle county boundary
County boundary and Delaware Bay?
County boundary and Sussex county boundary

GU_Polygon:
startPoint: -75.72, 38.83
intermediatePoint[10]:
-75.70, 38.46
-75.04, 38.45
-75.08, 38.80
-75.19, 38.81
-75.31, 38.94

-75.39, 38.95
-75.40, 38.93
-75.45, 38.91
-75.52, 38.86
-75.62, 38.83
endPoint: -75.72, 38.83
guInstanceName: Sussex
guTypeNameReference: County
guPolygonID: S
guInstanceCode: 10005
guCodingSystemReference: FIPS State and County Code
guFunctionalStatus: active

GU_GovernmentalUnit:
guTypeName: County
guTypeNameAbbreviation: CO
guTypeDefinition: Same as guPolygonID: N
guCodingSystemReference: FIPS State and County Code
guMaintenanceRelationshipList[1]:
Nests within the state of Delaware
guContiguousRelationshipList[4]:
County boundary and Maryland state boundary
County boundary and Kent county boundary
County boundary and Delaware Bay
County boundary and Atlantic Ocean

NOTE: This annex is for illustrative purposes only; the actual encoding of governmental unit boundary information depends upon the application.

D.3 Example metadata

Identification_Information:
Citation:
Citation_Information:
Originator: Bureau of Transportation Statistics (comp.)
Publication_Date: 1997
Title: 104th Congressional District Boundaries
Publication_Information:
Publication_Place: Washington, DC
Publisher: Bureau Transportation Statistics
Description:
Abstract: The 104th Congressional District Boundaries database is a geographic database of political boundaries of the 104th Congressional districts.
Purpose: The data provide users with information about the locations of congressional districts, primarily for national planning applications.
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1995
Currentness_Reference: publication date
Status:
Progress: Complete
Maintenance_and_Update_Frequency: Annually
Spatial_Domain:
Bounding_Coordinates:

West_Bounding_Coordinate: -75.66, 39.83
East_Bounding_Coordinate: -75.00, 38.80
North_Bounding_Coordinate: -75.66, 39.83
South_Bounding_Coordinate: -75.79, 39.72
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: area
Theme_Keyword: background
Theme_Keyword: polygon
Theme_Keyword: boundary
Theme_Keyword: congressional district
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: United States
Access_Constraints: None
Use_Constraints: None. Acknowledgement of the Bureau of Transportation Statistics National Transportation Atlas Database would be appreciated in products derived from these data.

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: No Information
Logical_Consistency_Report: No Information
Completeness_Report: No Information
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Census Bureau
Publication_Date: 1994
Title: TIGER Extract - Thinned Boundary Files
Type_of_Source_Media: Online
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1994
Source_Currentness_Reference: publication date
Source_Citation_Abbreviation: TIGER
Source_Contribution: Spatial information for the 104th Congressional District boundaries.
Process_Step:
Process_Description: Individual files for the Congressional Districts in Alaska, Hawaii, Puerto Rico, and the 48 contiguous states were merged into a single data set.
Process_Date: 1995

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: 0.000464
Longitude_Resolution: 0.000464
Geographic_Coordinate_Units: Decimal Degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum 83
Ellipsoid_Name: Geodetic Reference System 80

Entity_and_Attribute_Information:
  Detailed_Description:
    Entity_Type:
      Entity_Type_Label: CD104.ARE
      Entity_Type_Definition: Polygon Attribute Table.
      Entity_Type_Definition_Source: U.S. Census Bureau

Distribution_Information:
  Distributor:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: BTS Product Distribution Center
      Contact_Address:
        Address_Type: mailing and physical address
        Address: 400 Seventh Street, SW
        City: Washington
        State_or_Province: District of Columbia
        Postal_Code: 20590
      Contact_Voice_Telephone: (202) 366 DATA
      Contact_Facsimile_Telephone: (202) 366 3640
  Distribution_Liability: No information

  Standard_Order_Process:
    Digital_Form:
      Digital_Transfer_Information:
        Format_Name: BTS (Bureau of Transportation Statistics standard format for spatial data)
      Digital_Transfer_Option:
        Online_Option:
          Computer_Contact_Information:
            Network_Address:
              Network_Resource_Name: http://www.bts.gov/gis/ntatlas/background.html
       Fees: No information

Metadata_Reference_Information:
  Metadata_Date: 19950830
  Metadata_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: Bureau of Transportation Statistics
      Contact_Address:
        Address_Type: mailing and physical address
        Address: 400 Seventh Street, SW
        City: Washington
        State_or_Province: District of Columbia
        Postal_Code: 20590
      Contact_Voice_Telephone: (202) 366 3282
  Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata
  Metadata_Standard_Version: FGDC-STD-001-1998

Annex E
(informative)

Use of standard with other entities

While this Standard provides a standardized way to communicate boundary information for GUs and other specified legal entities, it may be used to communicate boundary information about other geographic entities. Annex E (informative) provides a non-exhaustive list of other geographic entities for which this Standard may be used:

- Local Legislative District
- Tribal Legislative District
- Voting District/Polling District
- School District
- Special Local District
- Federally defined or owned, and managed land (National Park Service areas, Bureau of Land Management areas, National Forest Service areas)
- State owned and managed land (state parks, state game lands, legally defined traffic zones)
- Locally owned and managed land (local parks, municipal land fills)
- Tribal owned and managed land
- Federally regulated or programmatic administration area (empowerment/enterprise zones, off-shore mineral rights, community block grant areas, qualified neighborhood areas qualifying for funding under some statute or regulation.

Annex F
(informative)

Governmental unit boundary file metadata requirement

Annex F (informative) describes the metadata information necessary to document a GU or other legal entity boundary dataset for exchange. Annex F is a subset of relevant FGDC *Content Standards for Digital Geospatial Metadata (Version 2.0)* metadata elements, maintaining all mandatory elements. Definitions for the terminology describing the characteristics of the data are the same as those defined for in Annex B (normative), provided in 7.2. This table is to be read in the same manner as that of Annex B.

Section/Element Number	Name	Definition/Content	Domain	O/C	MO	Data Type
1.0	Identification Information	Basic information about the data set	Lines 1.1-1.9	M	1	Compound
1.1	Citation	Information to be used to reference the data set	Line 8.0	M	1	Compound
1.2	Description	A characterization of the data set, including its intended use and limitations	Lines 1.2.1-1.2.2	M	1	Compound
1.2.1	Abstract	A brief narrative summary of the data set	Free text	M	1	Text
1.2.2	Purpose	A summary of the intentions with which the data set was developed	Free text	M	1	Text
1.3	Time Period Content	Time period(s) for which the data set corresponds to the currentness reference	Line 9.0	M	1	Compound
1.3.1	Currentness Reference	The basis on which the time period of content information is determined	"ground condition" " publication date" Free text	M	1	Text
1.4	Status	The state of and maintenance information for the data set	Lines 1.4.1-1.4.2	M	1	Compound
1.4.1	Progress	The state of the data set	"complete" "in work" "planned"	M	1	Text
1.4.2	Maintenance and Update Frequency	The frequency with which changes and additions are made to the data set after the initial data set is completed	"continually" "daily" "weekly" "monthly" "annually" "unknown" "as needed" "irregular" "none planned" Free text	M	1	Text
1.5	Spatial Domain	The geographic areal domain of the data set	Lines 1.5.1-1.5.1.4	M	1	Compound

1.5.1	BoundingCoordinates	The limits of coverage of a data set expressed by latitude and longitude values in the order western-most, eastern-most, northern-most, and southern-most. For data sets that include a complete band of latitude around the earth, the West Bounding Coordinate shall be assigned the value -180.0, and the East Bounding Coordinate shall be assigned the value 180.0.	Lines 1.5.1.1-1.5.1.4	M	1	Compound
1.5.1.1	West Bounding Coordinate	Western-most coordinate of the limit of coverage expressed in longitude	-180.0<=West Bounding Coordinate<=180.0	M	1	Real
1.5.1.2	East Bounding Coordinate	Eastern-most coordinate of the limit of coverage expressed in longitude	-180.0<=East Bounding Coordinate<=180.0	M	1	Real
1.5.1.3	North Bounding Coordinate	Northern-most coordinate of the limit of coverage expressed in latitude	-90.0<=North Bounding Coordinate<=90.0; North Bounding Coordinate<=South Bounding Coordinate	M	1	Real
1.5.1.4	South Bounding Coordinate	Southern-most coordinate of the limit of coverage expressed in latitude	-90.0<=South Bounding Coordinate<=90.0; South Bounding Coordinate<=North Bounding Coordinate	M	1	Real
1.6	Keywords	Words or phrases summarizing an aspect of the data set	Lines 1.6.1-1.6.2.2	M	1	Compound
1.6.1	Theme	Subjects covered by the data set (for a list of commonly used thesauri, see Part IV: Subject/index term sources in Network Development and MARC Standards Office, 1988, US MARC code list for realtors, sources, and description conventions: Washington, Library of Congress)	Lines 1.6.1.1-1.6.1.2	M	N	Compound
1.6.1.1	Theme Keyword Thesaurus	Reference to a formally registered thesaurus or a similar authoritative source of theme keywords	"None" Free text	M	1	Text
1.6.1.2	Theme Keyword	Common-use word or phrase used to describe the subject of the data set	Free text	M	N	Text

1.6.2	Place	Geographic locations characterized by the data set	1.6.2.1-1.6.2.2	C - if geographic location is expressed in a nominal, geometric manner	N	Compound
1.6.2.1	Place Keyword Thesaurus	Reference to a formally registered thesaurus or a similar authoritative source of theme place keywords	"None" "Geographic Names Information System" Free text	M	1	Text
1.6.2.2	Place Keyword	The geographic name of a location covered by a data set	Free text	M	N	Text
1.7	Access Constraints	Restrictions and legal prerequisites for accessing the data set. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the data set	"None" Free text	M	1	Text
1.8	Use Constraints	Restrictions and legal prerequisites for using the data set after access is granted. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the data set	"None" Free text	M	1	Text
1.9	Point of Contact	Contact information for an individual or organization that is knowledgeable about the data set	Line 10.0	O	1	Compound
2.0	Data Quality Information	A general assessment of the quality of the data set (Recommendations on information to be reported and tests to be performed are found in "Spatial Data Quality" which is chapter 3 of part 1 in Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washington, Department of Commerce, National Institute of Standards and Technology.)	Lines 2.1-2.5.2.3	C - when data quality information is available for the data set	1	Compound

2.1	Attribute Accuracy	An assessment of the accuracy of the identification of entities and assignment of attribute values in the data set	Line 2.1.1	C - when attribute accuracy quality information is available for the data set	1	Compound
2.1.1	Attribute Accuracy Report	An explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the tests used	Free text	M	1	Text
2.2	Logical Consistency Report	An explanation of the fidelity of relationships in the data set and tests used	Free text	M	1	Text
2.3	Completeness Report	Information about omissions, selection criteria, generalization, definitions used, and other rules used to derive the data set	Free text	M	1	Text
2.4	Positional Accuracy	An assessment of the accuracy of the positions of spatial objects	Lines 2.4.1-2.4.2.1	C - when positional accuracy quality information is available for the data set	1	Compound
2.4.1	Horizontal Positional Accuracy	An estimate of accuracy of the horizontal positions of the spatial objects	Line 2.4.1.1	C - when horizontal positional accuracy quality information is available for the data set	1	Compound
2.4.1.1	Horizontal Positional Accuracy Report	An explanation of the accuracy of the horizontal coordinate measurements and a description of the tests used	Free text	M	1	Text
2.4.2	Vertical Positional Accuracy	An estimate of accuracy of the vertical positions in the data set	Line 2.4.2.1	C - when vertical positional accuracy quality information is available for the data set	1	Compound

2.4.2.1	Vertical Positional Accuracy Report	An explanation of the accuracy of the vertical coordinate measurements and a description of the tests used	Free text	M	1	Text
2.5	Lineage	Information about the events, parameters, and source data which constructed the data set, and information about the responsible parties	Lines 2.5.1-2.5.2.3	M	1	Compound
2.5.1	Source Information	List of sources and a short discussion of the information contributed by each	Lines 2.5.1-2.5.1.6	C - if source information is known and relevant to the quality	N	Compound
2.5.1.1	Source Citation	Reference for a sources data set	Line 8.0	M	1	Compound
2.5.1.3	Type of Source Media	The medium of the source data set	"paper" "stable-base material" "microfiche" "microfilm" "audiocassette" "chart" " filmstrip" "transparency" "videocassette" "videodisc" "videotape" "physical model" "computer program" "disc" "cartridge tape" "magnetic tape" "online" "CD-ROM" "electronic bulletin board" "electronic mail system" Free text	M	1	Text
2.5.1.4	Source Time Period of Content	Time period(s) for which the source data set corresponds to the ground	Lines 2.5.1.4.1, 9.0	M	1	Compound
2.5.1.4.1	Source Currentness Reference	The basis on which the source time period of content information of the data is determined	"ground condition" "publication date" Free text	M	1	Text
2.5.1.5	Source Citation Abbreviation	Short-form alias for the source citation	Free text	M	1	Text
2.5.1.6	Source Contribution	Brief statement identifying the information contributed by the source to the data set	Free text	M	1	Text
2.5.2	Process Step	Information about a single event	Lines 2.5.2.1-2.5.2.3	M	N	Compound
2.5.2.1	Process Description	An explanation of the event and related parameters or tolerances	Free text	M	1	Text
2.5.2.3	Process Date	The date when the event was completed	"unknown" "not complete" free date	M	1	Date

4.0	Spatial Reference Information	The description of the reference frame for, and the means to encode, coordinates in the data set	Lines 4.1-4.2.2.4	C - if the reference frame of coordinates and/or coordinate encoding means is known	1	Compound
4.1	Horizontal Coordinate System Definition	The reference frame or system from which linear or angular quantities are measured and assigned to the position that a point occupies	Lines 4.1.1-4.1.4.4	C - if the reference frame of horizontal coordinates and/or the horizontal coordinate encoding means is known	1	Compound
4.1.1 OR 4.1.2 OR 4.1.3			Lines 4.1.1.1-4.1.1.3 OR 4.1.2.1-4.1.2.4.4 OR 4.1.3.1-4.1.3.2	M (one option must be selected)		
4.1.1	Geographic	The quantities of latitude and longitude which define the position of a point on the Earth's surface with respect to a reference spheroid	Lines 4.1.1.1-4.1.1.3	M	1	Compound
4.1.1.1	Latitude Resolution	The minimum difference between two adjacent latitude values expressed in Geographic Coordinate Units of measure	Latitude Resolution > 0.0	M	1	Real
4.1.1.2	Longitude Resolution	The minimum difference between two adjacent longitude values expressed in Geographic Coordinate Units of measure	Longitude Resolution > 0.0	M	1	Real
4.1.1.3	Geographic Coordinate Units	Units of measure used for the latitude and longitude values	"decimal degrees" "decimal minutes" decimal seconds" "degrees and decimal minutes" "degrees, minutes, and decimal seconds" "radians" "grads"	M	1	Text
4.1.2	Planar	The quantities of distances, or distances and angles, which define the position of a point on a reference plane to which the surface of the Earth has been projected	Lines 4.1.2.1-4.1.2.1.1	M	N	Compound
4.1.2.1 OR 4.1.2.2 OR 4.1.2.3			Lines 4.1.2.1.1 OR 4.1.2.2.1 OR 4.1.2.3.1-4.1.2.4.4	M (one option must be selected)		

4.1.2.1	Map Projection	The systematic representation of all or part of the surface of the Earth on a plane or developable surface	Lines 4.1.2.1.1	M	1	Compound
4.1.2.1.1	Map Projection Name	Name of the map projection	"Albers Conical Equal Area" "Azimuthal Equidistant" "Equidistant Conic" "Equirectangular" "General Vertical Near-Sided Perspective" "Gnomonic" "Lampert Azimuthal Equal Area" "Lambert Conformal Conic" "Mercator" "Modified Stereographic for Alaska" "Miller Cylindrical" "Oblique Mercator" "Orthographic" "Polar Stereographic" "Polyconic" "Robinson" "Sinusoidal" "Space Oblique Mercator" "Stereographic" "Transverse Mercator" "van der Grinten" Free text	M	1	Text
4.1.2.2	Grid Coordinate System	A plane-rectangular coordinate system usually based on, and mathematically adjusted to, a map projection so that geographic positions can be readily transformed to and from plane coordinates	Line 4.1.2.2.1	M	1	Compound
4.1.2.2.1	Grid Coordinate System Name	Name of the grid coordinate system	"Universal Transverse Mercator" "State Plane Coordinate System 1927" "State Plane Coordinate System 1983" "ARC Coordinate System" "other grid system"	M	1	Text
4.1.2.3	Local Planar	Any right-handed planar coordinate system of which the z-axis coincides with a plumb line through the origin that locally is aligned with the surface of the Earth	Lines 4.1.2.3.1-4.1.2.3.2	M	1	Compound
4.1.2.3.1	Local Planar Description	A description of the local planar system	Free text	M	1	Text
4.1.2.3.2	Local Planar Georeference Information	A description of the information provided to register the local planar system to the Earth (e.g. control points, satellite ephemeral data, inertial navigation data)	Free text	M	1	Text
4.1.2.4	Planar Coordinate Information	Information about the coordinate system developed on the planar surface	Lines 4.1.2.4.1	M	1	Compound

4.1.2.4.1	Planar Coordinate Encoding Method	The means used to represent horizontal positions	"coordinate pair" "distance and bearing" "row and column"	M	1	Text
4.1.2.4.2 OR 4.1.2.4.3			Lines 4.1.2.4.2.1-4.1.2.4.2.2 OR 4.1.2.4.3.1-4.1.2.4.3.5	M (one option must be selected)		
4.1.2.4.2	Coordinate Representation	The method of encoding the position of a point by measuring its distance from perpendicular reference axes (the "coordinate pair" and "row and column" methods)	Lines 4.1.2.4.2.1-4.1.2.4.2.2	M	1	Compound
4.1.2.4.2.1	Abscissa Resolution	The (nominal) minimum distance between the "x" or column values of two adjacent points, expressed in Planar Distance Units of measure	Abscissa Resolution> 0.0	M	1	Real
4.1.2.4.2.2	Ordinate Resolution	The (nominal) minimum distance between the "y" or row values of two adjacent points, expressed in Planar Distance Units of measure	Ordinate Resolution > 0.0	M	1	Real
4.1.2.4.3	Distance and Bearing Representation	A method of encoding the position of a point by measuring its distance and direction (azimuth angle) from another point	Lines 4.1.2.4.3.1-4.1.2.4.3.5	M	1	Compound
4.1.2.4.3.1	Distance Resolution	The minimum distance measurable between two points, expressed Planar Distance Units of measure	Distance Resolution > 0.0	M	1	Real
4.1.2.4.3.2	Bearing Resolution	The minimum angle measurable between two points, expressed in Bearing Units of measure	Bearing Resolution > 0.0	M	1	Real
4.1.2.4.3.3	Bearing Units	Units of measure used for angles	"Decimal degrees" "Decimal minutes" " Decimal Seconds" "Degrees and decimal minutes" "Degrees, minutes, and decimal seconds" "Radians" "Grads"	M	1	Text
4.1.2.4.3.4	Bearing Reference Direction	Direction from which the bearing is measured	"North" "South"	M	1	Text
4.1.2.4.3.5	Bearing Reference Meridian	Axis from which the bearing is measured	"Assumed" "Grid" "Magnetic" "Astronomic" "Geodetic"	M	1	Text
4.1.2.4.4	Planar Distance Units	Units of measure used for distances	"meters" "international feet" "survey feet" Free text	M	1	Text

4.1.3	Local	A description of any coordinate system that is not aligned with the surface of the Earth	Lines 4.1.3.1-4.1.3.2	M	1	Compound
4.1.3.1	Local Description	A description of the coordinate system and its orientation to the surface of the Earth	Free text	M	1	Text
4.1.3.2	Local Georeference Information	A description of the information provided to register the local system to the Earth (e.g. control points, satellite ephemeral data, inertial navigation data)	Free text	M	1	Text
4.1.4	Geodetic Model	Parameters for the shape of the earth		C - if the geodetic model for the coordinates in the dataset is known	1	Compound
4.1.4.1	Horizontal Datum Name	The identification given to the reference system used for defining the coordinates of points	"North American Datum of 1927" "North American Datum of 1983" Free text	C - if the horizontal datum for the coordinates in the dataset is known	1	Text
4.1.4.2	Ellipsoid Name	Identification given to established representations of the Earth's shape	"Clarke 1866" "Geodetic Reference System 80" Free text	M	1	Text
4.1.4.3	Semi-Major Axis	Radius of the equatorial axis of the ellipsoid	Semi-major Axis > 0.0	M	1	Real
4.1.4.4	Denominator of Flattening Ratio	The denominator of the ratio of the difference between the equatorial and polar radii of the ellipsoid when the numerator is set to 1	Denominator of Flattening > 0.0	M	1	Real
4.2	Vertical Coordinate System Definition	The reference frame or system from which vertical distances (altitude or depths) are measured	Lines 4.2.1-4.2.2.4	C - if vertical reference frame or system for the coordinates in the dataset is known	1	Compound
4.2.1	Altitude System Definition	The reference frame or system from which altitudes (elevations) are measured. The term "altitude" is used instead of the common term "elevation" to conform to the terminology in Federal Information Processing Standards 70-1 and 173	Lines 4.2.1.1-4.2.1.4	C - if altitude reference frame or system for the coordinates is known	1	Compound

4.2.1.1	Altitude Datum Name	The identification given to the surface taken as the surface of reference from which altitudes are measured	"National Geodetic Vertical Datum of 1929" "North American Vertical Datum of 1998" Free text	M	1	Text
4.2.1.2	Altitude Resolution	The minimum distance possible between two adjacent altitude values, expressed in Altitude Distance Units of measure	Altitude Resolution > 0.0	M	N	Real
4.2.1.3	Altitude Distance Units	Units in which altitudes are recorded	"meters" "feet" Free text	M	1	Text
4.2.1.4	Altitude Encoding Method	The means used to encode the altitudes	"Explicit elevation coordinate included with horizontal coordinates" "Implicit coordinate" "Attribute values"	M	1	Text
4.2.2	Depth System Definition	The reference frame or system from which depths are measured	Lines 4.2.2.1-4.2.2.4	C - if depth reference frame or system for the coordinates is known	1	Compound

4.2.2.1	Depth Datum Name	The identification given to surface of reference from which depths are measured	"Local surface" "Chart datum; datum for sounding reduction" "Lowest astronomical tide" "Highest astronomical tide" "Mean low water" "Mean high water" "Mean sea level" "Land survey datum" "Mean low water springs" "Mean high water springs" "Mean low water neap" "Mean high water neap" "Mean lower low water" "Mean lower high water" "Spring tide" "Tropic lower low water" "Neap tide" "High water" "Higher high water" Low water" "Low-water datum" "Lowest low water" "Lower low water" "Lowest normal low water" "Mean tide level" "Indian spring low water" "High-water full and charge" "Low-water full and charge" "Columbia River datum" "Gulf Coast low water datum" "Equatorial springs low water" "Approximate lowest astronomical tide" "No correction" Free text	M	1	Text
4.2.2.2	Depth Resolution	The minimum distance possible between two adjacent depth values, expressed in Depth Distance Units of measure	Depth Resolution > 0.0	M	N	Real
4.2.2.3	Depth Distance Units	Units in which depths are recorded	"meters" "feet" Free text	M	1	Text
4.2.2.4	Depth Encoding Method	The means used to encode depths	"Explicit depth coordinate included with horizontal coordinates" "Implicit coordinate" "Attribute values"	M	1	Text
5	Entity and Attribute Information	Details about the information content of the data set, including the entity types, their attributes, and the domains from which attribute values may be assigned	Lines 5.1-5.2.2	C - if entity type, entity attribute, and attribute value domains are used in the data set	1	Compound

5.1 AND/OR 5.2			Lines 5.1.1-5.1.1.3 AND/OR 5.2.1-5.2.2	M (one option must be selected)		Compound
5.1	Detailed Description	Description of the entities, attributes, attribute values, and related characteristics encoded in the data set	Lines 5.1.1-5.1.1.3	M	N	Compound
5.1.1	Entity Type	The definition and description of a set into which similar entity instances are classified	Lines 5.1.1.1-5.1.1.3	M	1	Compound
5.1.1.1	Entity Type Label	The name of the entity	Free text	M	1	Text
5.1.1.2	Entity Type Definition	The description of the entity type	Free text	M	1	Text
5.1.1.3	Entity Type Definition Source	The authority of the definition	Free text	M	1	Text
5.2	Overview Description	Summary of, and citation to detailed description of, the information content of the data set	Lines 5.2.1-5.2.2	M	N	Compound
5.2.1	Entity and Attribute Overview	Detailed summary of the information contained in a data set	Free text	M	1	Text
5.2.2	Entity and Attribute Detail Citation	Reference to the complete description of the entity types, attributes, and attribute values for the data set	Free text	M	N	Text
6	Distribution Information	Information about the distributor of and options for obtaining the data set	Lines 6.1-6.4.3	C - if information about data set distribution is available or known	N	Compound
6.1	Distributor	The party from whom the data set may be obtained	Line 10.0	M	1	Compound
6.3	Distribution Liability	Statement of the liability assumed by the distributor	Free text	M	1	Text
6.4	Standard Order Process	The common ways in which the data set may be obtained or received, and related instructions and fee information	Lines 6.4.2-6.4.3	C - if order process exists and is known	N	Compound
6.4.1 OR 6.4.2			Lines 6.4.1 OR 6.4.2.2.1.1.1.1	M (one option must be selected)		Compound
6.4.1	Non-Digital Form	The description of options for obtaining the data set on non-computer-compatible media	Free text	M	1	Text

6.4.2	Digital Form	The description of options for obtaining the data set on computer-compatible media	Free text	M	N	Text
6.4.2.1	Digital Transfer Information	Description of the form of the data to be distributed	Line 6.4.2.1.1	M	1	Compound
6.4.2.1.1	Format Name	The name of the data transfer format	"ARCE" "ARCG" "ASCII" "BIL" "BIP" "BSQ" "CDF" "CFF" "COORD" "DEM" "DFAD" "DGN" "DIGEST" "DLG" "DTED" "DWG" "DX90" "DXF" "ERDAS" "GRASS" "HDF" "IGDS" "IGES" "MOSS" "netCDF" "NITF" "RPF" "RVC" "FVG" "SDTS" "SIF" "SLF" TIFF" "TGRLN' "VPT" Free text	M	1	Text
6.4.2.2	Digital Transfer Option	The means and media by which a data set is obtained from the distributor	Lines 6.4.2.2.1-6.4.2.2.1.1.1.1	M	N	Compound
6.4.2.2.1	Online Option	Information required to directly obtain the data set electronically	Lines 6.4.2.2.1.1-6.4.2.2.1.1.1.1	M	1	Compound
6.4.2.2.1.1	Computer Contact Information	Instructions for establishing communications with the distribution computer	Lines 6.4.2.2.1.1.1-6.4.2.2.1.1.1.1	M	N	Compound
6.4.2.2.1.1.1	Network Address	The electronic address from which the data set can be obtained from the distribution computer.	Line 6.4.2.2.1.1.1.1	M	1	Compound
6.4.2.2.1.1.1.1	Network Resource Name	The name of the file or service from which the data set can be obtained	Free text	M	N	Text
6.4.3	Fees	The fees and terms for retrieving the data set	Free text	M	1	Text
7	Metadata Reference Information	Information on the currentness of the metadata information, and the responsible party	Lines 7.1-7.6	M	1	Compound
7.1	Metadata Date	The date that the metadata were created or last updated	free date	M	1	Date
7.2	Metadata Review Date	The date of the latest review of the metadata entry	free date; Metadata Future Review Date later than Metadata Date	O	1	Date
7.4	Metadata Contact	The party responsible for the metadata information	Line 10.0	M	1	Compound
7.5	Metadata Standard Name	The name of the metadata standard used to document the data set	"FGDC Content Standard for Digital Geospatial Metadata" Free text	M	1	Text

7.6	Metadata Standard Version	Identification of the version of the metadata standard used to document the data set	Free text	M	1	Text
8	Citation Information	The recommended reference to be used for the data set (Note: this section provides a means of stating the citation of a data set, and is used by other sections of the metadata standard. This section is never used alone.)	Lines 8.1-8.10	M	1	Compound
8.1	Originator	The name of the organization or individual that developed the data set. If the name of editors or compilers are provided, the name must be followed by "(ed.)" or "(comp.)" respectively	"Unknown" Free text	M	N	Text
8.2	Publication Date	The date when the data set is published or otherwise made available for release	"Unknown" "Unpublished material" free date	M	1	Date
8.4	Title	The name by which the data set is know	Free text	M	1	Text
8.8	Publication Information	Publication details for published data sets	Lines 8.81-8.82	C if the data set is published	1	Compound
8.8.1	Publication Place	the name of the city (and state or province, and country, if needed to identify the city) where the data set was published or released	Free text	M	1	Text
8.8.2	Publisher	the name of the individual or organization that published the data set	Free text	M	1	Text
8.1	Online Linkage	The name of an online computer resource that contains the data set. Entries should follow the Uniform Resource Locator convention of the Internet	Free text	O	1	Text
9	Time Period Information	Information about the date and time of an event. (Note: this section provides a means of stating temporal information, and is used by other sections of the metadata standard. This sections is never used alone.)	Lines 9.1-9.3.3	M	1	Compound
9.1 OR 9.2 OR 9.3			Lines 9.1.1 OR 9.1-9.1.1 OR 9.3.1-9.3.3	M (one loption must be selected)		
9.1	Single Date/Time	Means of encoding a single date and time	Line 9.1.1	M	1	Compound

9.1.1	Calendar Date	The year (and optionally month, or month and day)	"Unknown" free date	M	1	Date
9.2	Multiple Dates/Times	Means of encoding multiple individual dates and times	Lines 9.1-9.1.1	M	N	Compound
9.3	Range of Dates/Times	Means of encoding a range of dates and times	Lines 9.3.1-9.3.3	M	1	Compound
9.3.1	Beginning Date	The first year (and optionally month, or month and day) of the event	"Unknown" free date	M	1	Date
9.3.3	Ending Date	The last year (and optionally month, or month and day) for the event	"Unknown" free date	M	1	Date
10	Contact Information	Identity of, and means to communicate with, person(s) and organization(s) associated with the data set (Note: this section provides a means of identifying individuals and organizations, and is used by other sections of the metadata standard. This section is never used alone.)	Lines 10.1-10.8	M	1	Compound
10.1 OR 10.2			Lines 10.1.1-10.1.2 OR 10.1.2	M (one option must be selected)		
10.1	Contact Person Primary	The person, and the affiliation of the person, associated with the data set. Used in cases where the association of the person to the data set is more significant than the association of the organization to the data set.	Lines 10.1.1-10.1.2	M	1	Compound
10.1.1	Contact Person	The name of the individual to which the contact type applies	Free text	M	1	Text
10.1.2	Contact Organization	The name of the organization to which the contact type applies	Free text	O	1	Text
10.2	Contact Organization Primary	The organization, and the member of the organization, associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set	Line 10.1.2	M	1	Compound

10.1.2	Contact Organization	The name of the organization to which the contact type applies	Free text	M	1	Text
10.1.1	Contact Person	The name of the individual to which the contact type applies	Free text	O	1	Text
10.3	Contact Position	The title of the individual	Free text	O	1	Text
10.4	Contact Address	The address for the organization or individual	Lines 10.4.1-10.4.6	M	N	Compound
10.4.1	Address Type	The information provided by the address	"mailing" "physical" "mailing and physical", Free text	M	1	Text
10.4.2	Address	An address line for the address	Free text	C - if the contact address is mailing type	N	Text
10.4.3	City	The city of the address	Free text	M	1	Text
10.4.4	State or Province	The state or province of the address	Free text	M	1	Text
10.4.5	Postal Code	The ZIP or other postal code of the address	Free text	M	1	Text
10.4.6	Country	The country of the address	Free text	O	1	Text
10.5	Contact Voice Telephone	The telephone number by which individuals can speak to the organization or individual	Free text	M	N	Text
10.7	Contact Facsimile Telephone	The telephone number of a facsimile machine of the organization or individual	Free text	O	N	Text
10.8	Contact Electronic Mail Address	The address of the electronic mailbox of the organization or individual	Free text	O	N	Text

Annex G
(informative)

Diagram of governmental unit boundary description component characteristics

Annex G (informative) is a graphic depiction of the organization and hierarchy of data elements and compound elements that define the information content for a GU boundary. All compound elements are described by data elements; data elements are the primitive items of data.

GU Boundary Description Components, or GU Information, are presented in three sections: References, GU Type Information and GU Instance Information. Subsections within each section contain the compound elements and data elements, each of which have six distinct characteristics as defined in 7.2: name, definition, domain values, obligation/condition, maximum occurrence and data type.

This annex illustrates the GU Information nonspecifically, by name, obligation, and maximum occurrence. The format for GU description begins with the most generalized compound element and moves inward towards the more specific data elements. Both compound elements and data elements may be excluded if the obligation/condition is optional, or the conditions specified for the element are not met. Annex G is to be used in conjunction with Annex H (informative), the tabular depiction of the boundary description components. The numbers in the lower right corner of the data element depiction refers to its line number in Annex H. Repeatable refers to the possible multiple occurrence of the element, described as maximum occurrence in Annex H.

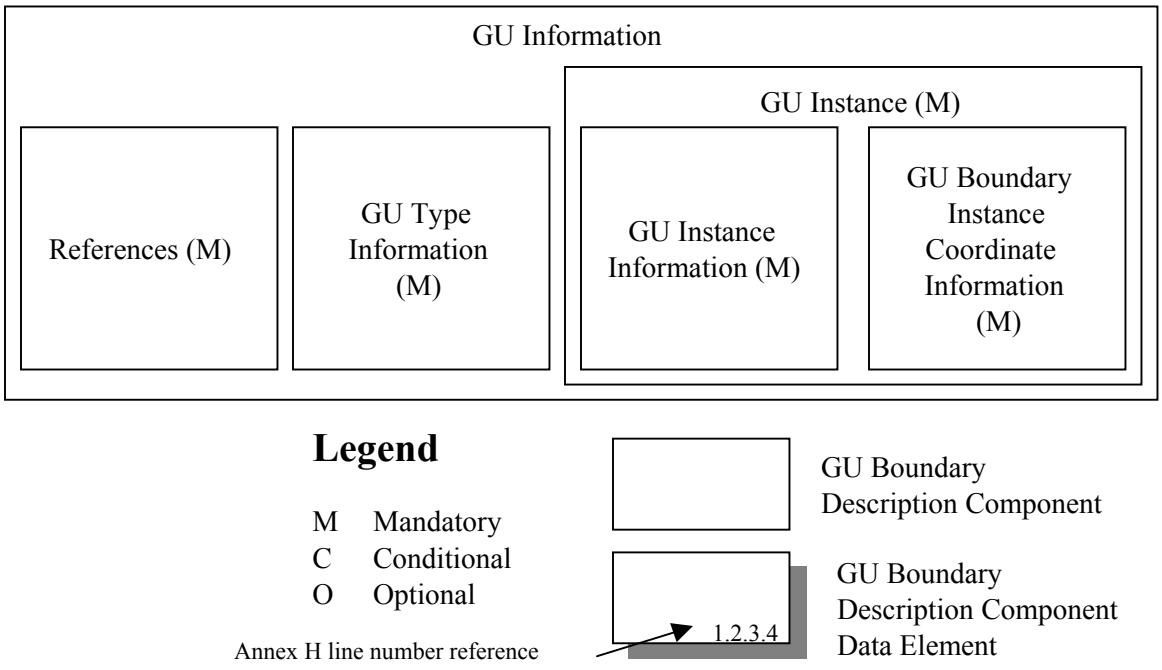


Figure G.1

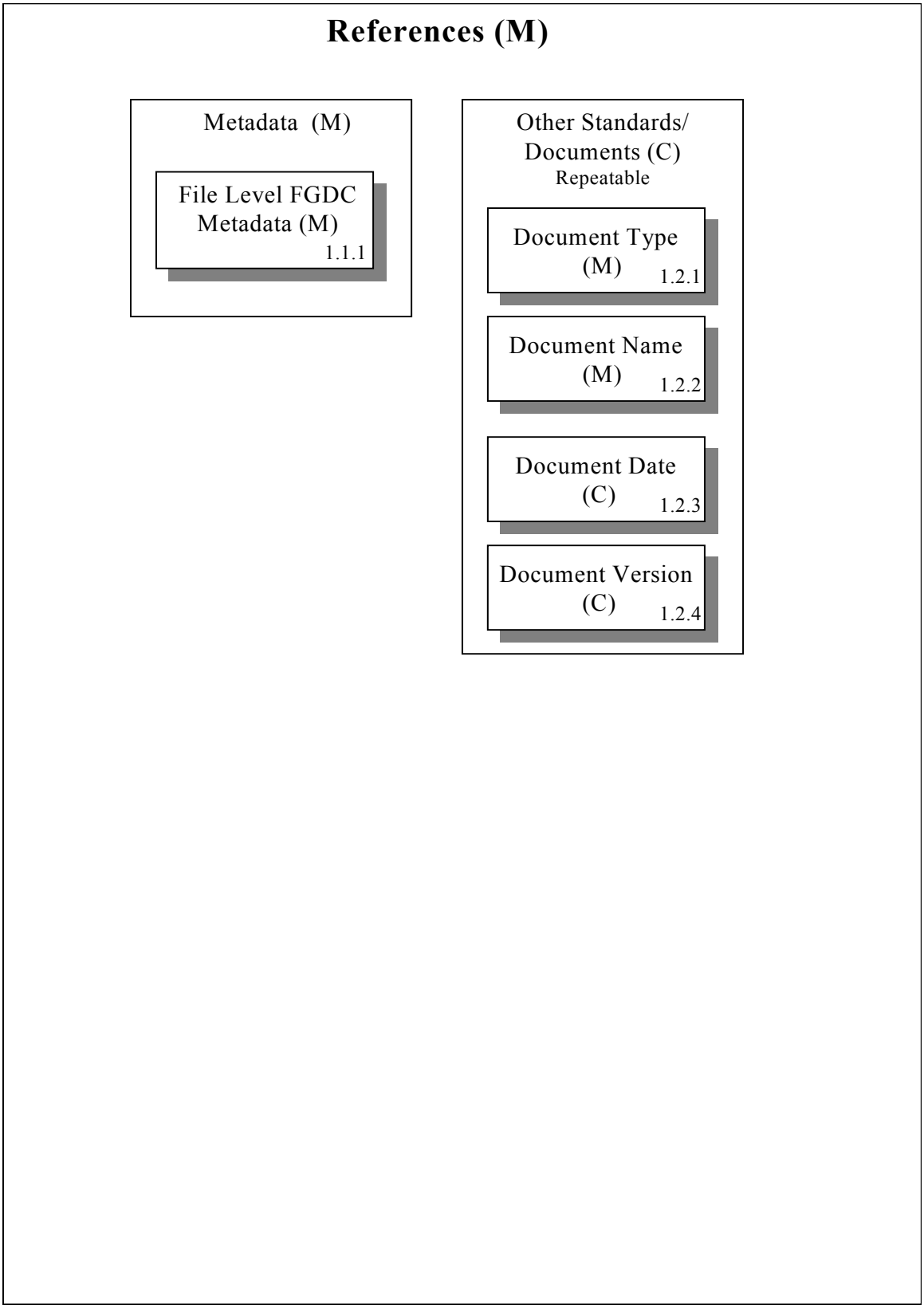
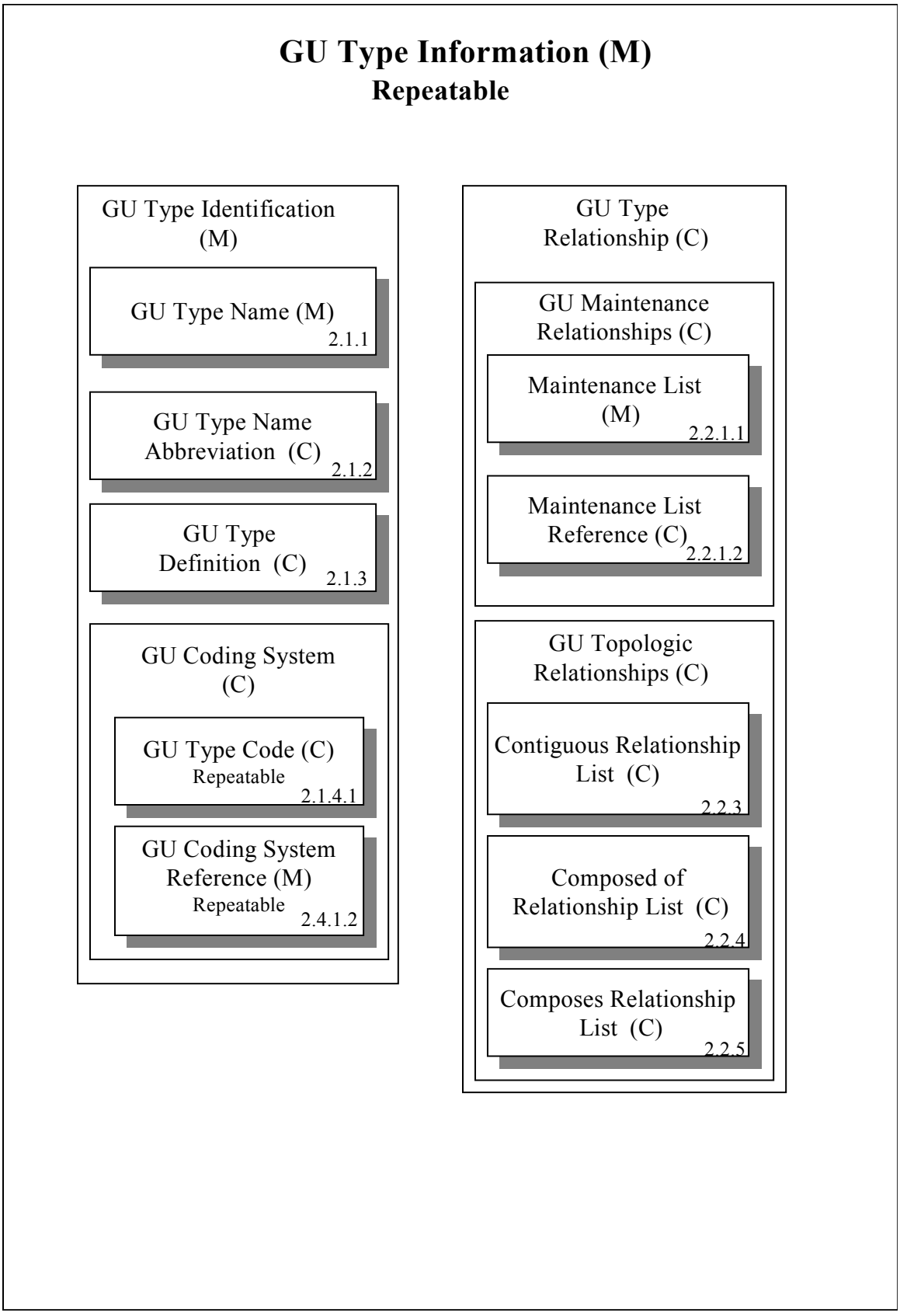

References (M)
Metadata (M)
File Level FGDC Metadata (M)
1.1.1
Other Standards/ Documents (C)
Repeatable
Document Type (M)
1.2.1
Document Name (M)
1.2.2
Document Date (C)
1.2.3
Document Version (C)
1.2.4

Figure G.2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Repeatable
GU Type Identification (M)
GU Type Name (M)
2.1.1
GU Type Name Abbreviation (C)
2.1.2
GU Type Definition (C)
2.1.3
GU Coding System (C)
GU Type Code (C)
Repeatable
2.1.4.1
GU Coding System Reference (M)
Repeatable
2.4.1.2
GU Type Relationship (C)
GU Maintenance Relationships (C)
Maintenance List (M)
2.2.1.1
Maintenance List Reference (C)
2.2.1.2
GU Topologic Relationships (C)
Contiguous Relationship List (C)
2.2.3
Composed of Relationship List (C)
2.2.4
Composes Relationship List (C)
2.2.5

Figure G.3

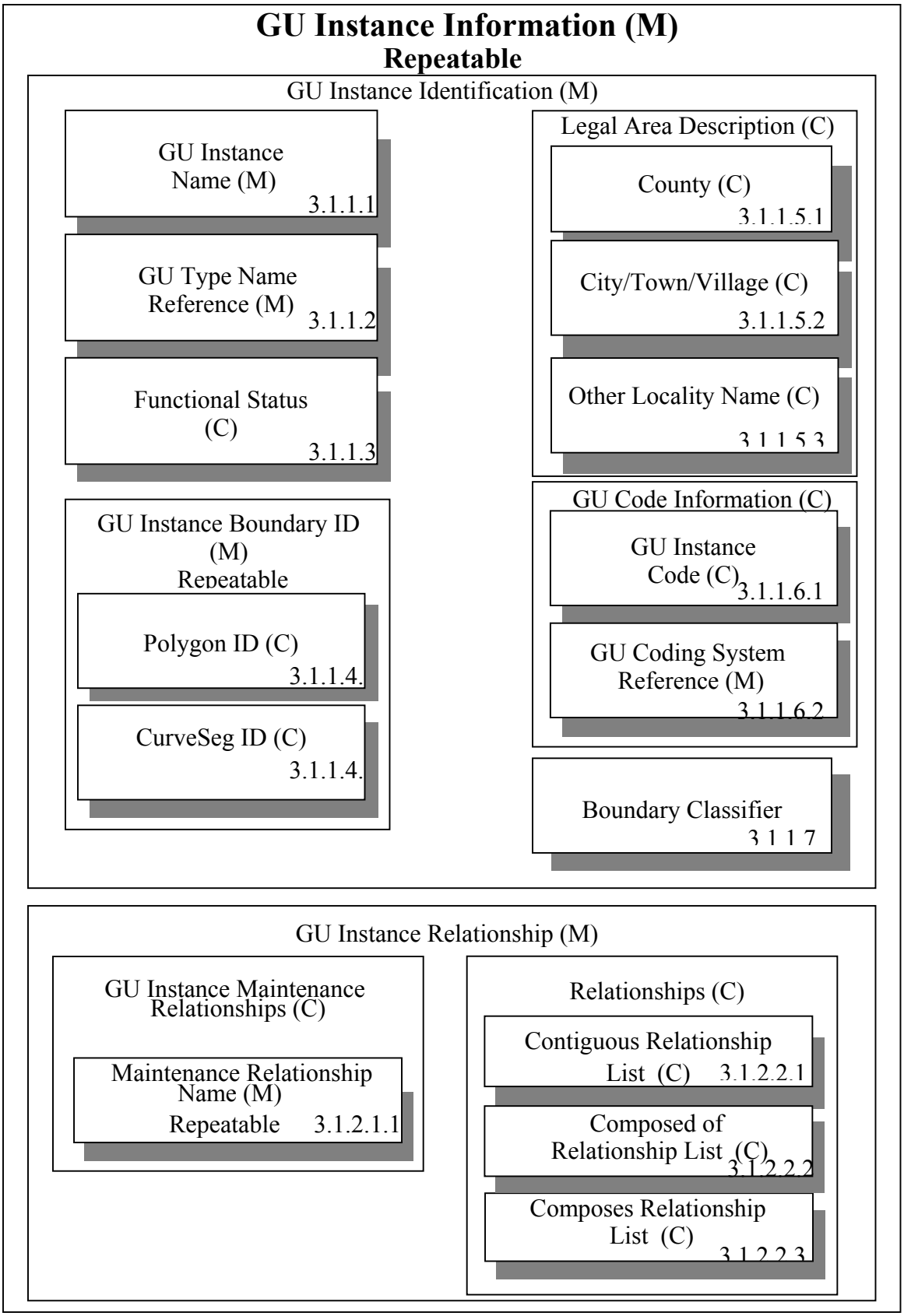
GU Instance Information (M)
Repeatable
GU Instance Identification (M)
GU Instance Name (M) 3.1.1.1
GU Type Name Reference (M) 3.1.1.2
Functional Status (C) 3.1.1.3
GU Instance Boundary ID (M) Repeatable
Polygon ID (C) 3.1.1.4.
CurveSeg ID (C) 3.1.1.4.
Legal Area Description (C)
County (C) 3.1.1.5.1
City/Town/Village (C) 3.1.1.5.2
Other Locality Name (C) 3.1.1.5.3
GU Code Information (C)
GU Instance Code (C) 3.1.1.6.1
GU Coding System Reference (M) 3.1.1.6.2
Boundary Classifier 3.1.1.7
GU Instance Relationship (M)
GU Instance Maintenance Relationships (C)
Maintenance Relationship Name (M) Repeatable 3.1.2.1.1
Relationships (C)
Contiguous Relationship List (C) 3.1.2.2.1
Composed of Relationship List (C) 3.1.2.2.2
Composes Relationship List (C) 3.1.2.2.3

Figure G.4

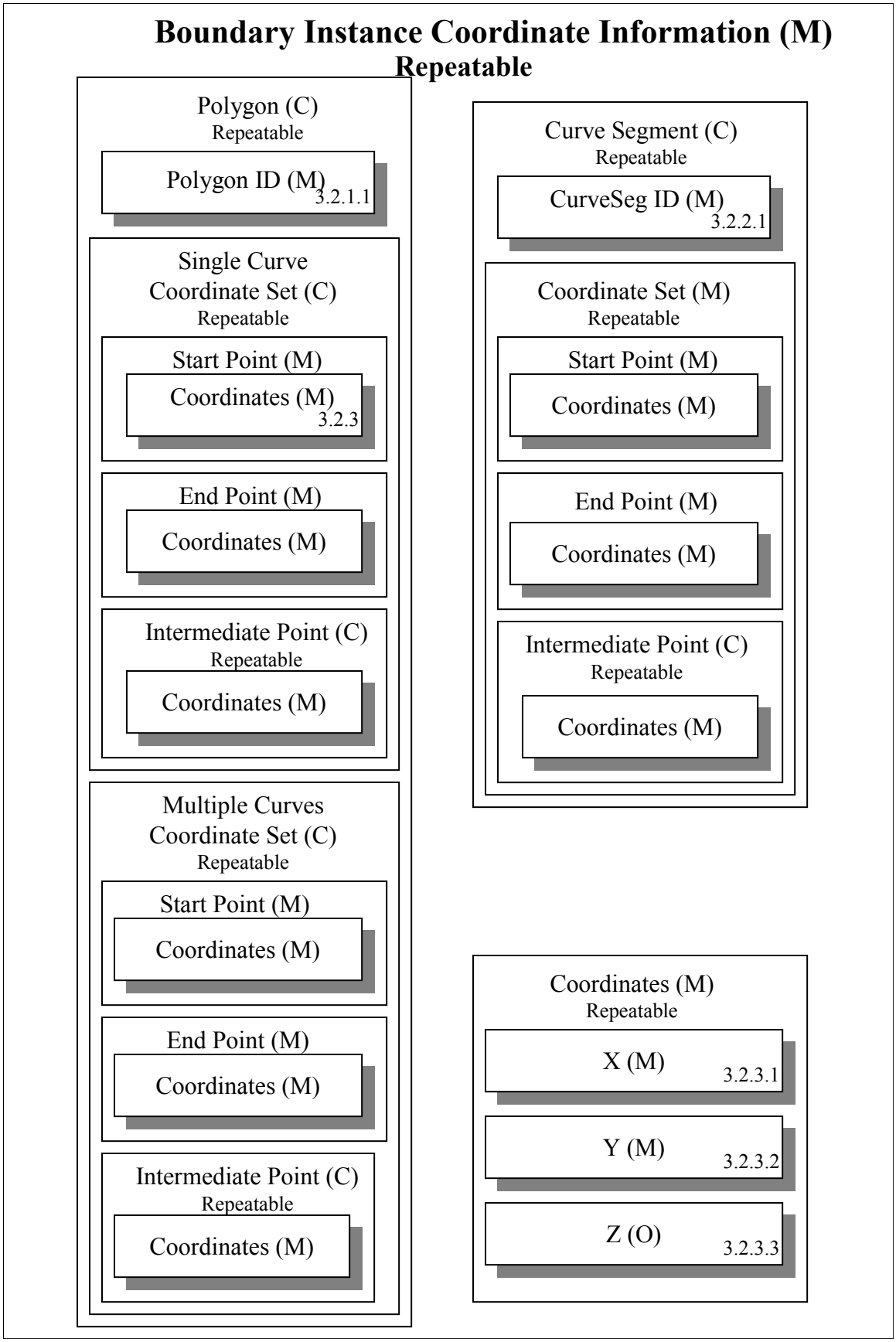
Boundary Instance Coordinate Information (M)
Repeatable
Polygon (C)
Repeatable
Polygon ID (M)
3.2.1.1
Single Curve
Coordinate Set (C)
Repeatable
Start Point (M)
Coordinates (M)
3.2.3
End Point (M)
Coordinates (M)
Intermediate Point (C)
Repeatable
Coordinates (M)
Multiple Curves
Coordinate Set (C)
Repeatable
Start Point (M)
Coordinates (M)
End Point (M)
Coordinates (M)
Intermediate Point (C)
Repeatable
Coordinates (M)
Curve Segment (C)
Repeatable
CurveSeg ID (M)
3.2.2.1
Coordinate Set (M)
Repeatable
Start Point (M)
Coordinates (M)
End Point (M)
Coordinates (M)
Intermediate Point (C)
Repeatable
Coordinates (M)
Coordinates (M)
Repeatable
X (M)
3.2.3.1
Y (M)
3.2.3.2
Z (O)
3.2.3.3

Figure G.5

Annex H
(informative)

Table of governmental unit boundary description component characteristics

Annex H (informative) describes the requisite information necessary to exchange GU and other legal entity boundary data. Definitions for the terminology describing the characteristics of the data are provided in 7.2.

To implement Annex H, one shall follow the Line numbers in sequence and consult the Obligation/Condition (O/C) to determine if the component is mandatory (M), conditional (C) and its conditions are met, or if it is optional (O). Once it is determined that the component is required for GU boundary documentation through its definition and obligation/condition, one shall refer to the domain which describes the valid values that can be assigned to the data element. If the component is a compound element, the domain will specify the lines of data elements to include. If the component is a compound element, the line will be grey, the domain will specify the appropriate lines for the component, and the data type will specify 'compound'. For data elements the characteristic "data type" describes the kind of value to be provided, e.g. integer, real, text. The maximum occurrence (MO) will specify if the element shall only be recorded one time (1) or if the element is repeatable from one to many times (N).

Line #	Name	Definition/Content	Domain	O/C	MO	Data Type
1.0	References	Relevant documentation to the GU dataset	Lines 1.1 - 1.2.4	M	1	Compound
1.1	Metadata	Documentation that describes the content, quality, condition, and other characteristics of data	Line 1.1.1	M	1	Compound
1.1.1	File Level FGDC Metadata	Metadata information for the GU dataset as determined in the Standard	Annex D	M	1	Text/Real
1.2	Other Standards/ Documents	Standards and other relevant documents referenced when documenting the GU dataset	Lines 1.2.1 - 1.2.5	C-if other standards or documents are used in GU boundary documentation	N	Compound
1.2.1	Document Type	Description of the type of document referenced	Standard, Document, Free Text	M	1	Text
1.2.2	Document Name	Name of document referenced	Free Text	M	1	Text
1.2.3	Document Date	Date of document referenced	Free Date	C - if date is known	1	Real
1.2.4	Document Version	Version number of document referenced	Free text	C - if version is known	1	Text

2.0	GU Type Information	Information describing the type of GU whose data are being described	Lines 1.1 - 1.3.1	M	1	Compound
2.1	GU Type Identification	Specific identification information describing the type of GU whose data are being described	Lines 1.1.1 -1.1.4	M	1	Compound
2.1.1	GU Type Name	The designated name for the type of GU whose data are being described	Terms in Section 4.1.1, Annex E, Annex F, Free Text	M	1	Text
2.1.2	GU Type Name Abbreviation	The abbreviated name for the type of GU whose data are being described	Free Text	C - if an abbreviation exists for GU Type Name	1	Text
2.1.3	GU Type Definition	Definition of the type of GU whose data are being described	Definitions in Section 4.1.1, Annex E, Free Text	C - if the GU Type Name and GU Type Definition are known	1	Text
2.1.4	GU Coding System	The coding system which identifies the GU being described	Lines 2.1.4.1 - 2.1.4.2	C - if a coding system exists	1	Compound
2.1.4.1	GU Type Code	The specific code which identifies the GU being described	Free Number	C - if a type code exists	N	Text/Real
2.1.4.2	GU Coding System Reference	GU Type Code reference documentation	FIPS Code, Free Text, Free Number	M	1	Text/Real
2.2	GU Type Relationship	Information describing one or more relationships the GU being described shares with other GUs	Lines 2.2.1 - 2.2.2.3	C - if one or more type relationships exist	1	Compound
2.2.1	GU Maintenance Relationships	Common areal information between one or more GUs or legal entities and geographic area features	Lines 2.2.1.1 - 2.2.1.2	C - if one or more maintenance relationships exist for the GU being documented	N	Compound
2.2.1.1	Maintenance List	List of maintenance relationships for the GU type being described	Free Text	C - if a maintenance list exists	N	Text
2.2.1.2	Maintenance List Reference	The maintenance relationship list reference document	Free Text	M	N	Text
2.2.2	GU Topologic Relationships	Conditional or characteristic relationships that apply to GUs and legal entities	Lines 2.2.2.1 - 2.2.2.3	C - if one or more topologic relationships exist for the GU being documented	1	Compound
2.2.2.1	Contiguous Relationship List	List of GUs or feature objects that are either adjacent to one another, touch at a common point, or share a boundary	Free Text	C - if one or more contiguous relationships exist	N	Text

2.2.2.2	Composed of Relationship List	List of GUs or feature objects that constitute the GU being documented	Free Text	C - if one or more composed of relationships exist	N	Text
2.2.2.3	Composes Relationship List	List of GUs of which the GU being documented always forms a part	Free Text	C - if one or more composes relationships exist	N	Text
3.0	GU Instance	Single representation of a GU feature	Lines 3.1 - 3.2.3.3	M	N	Compound
3.1	GU Instance Information	Information describing the single representation of the feature type, or specific GU documented	Lines 3.1.1 - 3.2.2.3	M	N	Compound
3.1.1	GU Instance Identification	Identification of the single representation of the feature type, or specific GU described	Lines 3.1.1.1 - 3.1.6.2	M	1	Compound
3.1.1.1	GU Instance Name	Name of the GU instance	Free Text	M	1	Text
3.1.1.2	GU Type Name Reference	Reference to the GU type name	Line 2.1.1	M	1	Text
3.1.1.3	Functional Status	Administrative or legal activities associated with performing the legally prescribed functions of a governmental unit	nonfunctioning, active, inactive	C - if functional status is known	1	Text
3.1.1.4	GU Instance Boundary ID	Specific identifier assigned to a GU boundary instance	Lines 3.1.1.4.1 - 3.1.4.2	M	1	Compound
3.1.1.4.1	Polygon ID	Unique identifier assigned to the boundary polygon	Free text, Free number	C - if boundary is expressed as a polygon	1	Text/Real
3.1.1.4.2	CurveSegID	Unique identifier assigned to the boundary curve segment	Free text, Free number	C - if boundary is expressed as curve segments	1	Text/Real
3.1.1.5	Legal Area Description	Description of the legal area, a geographic area whose boundaries, name, origin, and legal/statistical area description result from charters, laws, treaties, or other administrative or governmental action	Free text	C - if legal area description is known	1	Text
3.1.1.5.1	County	County as defined in Annex E	Free text	C - if the GU being documented is a county	1	Text
3.1.1.5.2	City/ Town/ Village	City, Town, and Village, as defined in Annex E	Free text	C - if the GU being documented is a city, town, or village	1	Text

3.1.1.5.3	Other Locality Name	Those locations that are not County, City, Town, or Village, as defined in Annex E or other locality name	Free text	C - if the GU being described is not a county, city, town, or village	1	Text
3.1.1.6	GU Code Information	Information describing GU Type Code and GU Instance Code	Lines 3.1.1.6.1 - 3.1.1.6.2	C- if a GU code exists	1	Compound
3.1.1.6.1	GU Instance Code	Specific code which identifies the GU instance being described	Free text, Free number	C - if an instance code exists	1	Text/Real
3.1.1.6.2	GU Coding System Reference	GU Type Code reference	Line 2.1.4.2	M	1	Compound
3.1.1.7	Boundary Classifier	A term or phrase which describes the status of the boundary	Free text	C - if one or more boundary classifiers exist	N	Text
3.1.2	GU Instance Relationship	Information about one or more relationships the GU being described shares with other GUs	Lines 3.1.2.1 - 3.1.2.2.3	M	N	Compound
3.1.2.1	GU Instance Maintenance Relationships	Common areal information between the described GU entity and geographic area features	Lines 3.1.2.1.1 - 3.1.2.2.3	C - if one or more maintenance relationships exist	N	Compound
3.1.2.1.1	Maintenance Relationship Name	Name of the referenced maintenance relationship	Free Text	M	N	Text
3.1.2.2	GU Topologic Relationships	Conditional or characteristic relationships that apply to the specific GUs being described	Lines 3.1.2.2.1-3.1.2.2.3	C - if one or more topological relationships exist	N	Compound
3.1.2.2.1	Contiguous Relationship List	List of GUs or feature objects that are either adjacent to one another, touch at a common point, or share a boundary	Line 2.2.2.1, free text	C - if one or more contiguous relationships exist	N	Text
3.1.2.2.2	Composed of Relationship List	List of GUs or feature objects that constitute the GU being documented	Line 2.2.2.2, free text	C - if one or more composed of relationships exist	N	Text
3.1.2.2.3	Composes Relationship List	List of GUs of which the GU being documented always forms a part	Line 2.2.2.3, free text	C - if one or more composes relationships exist	N	Text
3.2	Boundary Instance Coordinate Information	Information describing the specific GU boundary being described	Lines 3.2.1-3.2.3.3	M	N	Compound
3.2.1	Polygon	Set of line segments that define a GU boundary being described	Lines 3.2.1.1-3.2.1.3	C-if the delineation of the GU boundary file consists of polygons	N	Compound
3.2.1.1	Polygon ID	Identification for the polygon	Free Text, Free Number	M	1	Text/Real

3.2.1.2	Single Curve Coordinate Set	Set of coordinates with no repetition that define a curve	Lines 3.2.1.2.1 - 3.2.1.2.3.1	C - if the polygon consists of a single curve	N	Compound
3.2.1.2.1	Start Point	First point of a curve	Line 3.2.1.2.1.1	M	1	Compound
3.2.1.2.1.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.2.2	End Point	Last point of a curve	Line 3.2.1.2.2.1	M	1	Compound
3.2.1.2.2.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.2.3	Intermediate Point	Point on a curve	Line 3.2.1.2.3.1	C - if one or more intermediate points exist	N	Compound
3.2.1.2.3.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.3	Multiple Curves Coordinate Set	Collection of coordinates with no repetition that define more than one curve	Lines 3.2.1.3.1 - 3.2.1.3.3.1	C-if the polygon consists of multiple curves	N	Compound
3.2.1.3.1	Start Point	First point of a curve	Line 3.2.1.3.1.1	M	1	Compound
3.2.1.3.1.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.3.2	End Point	Last point of a curve	Line 3.2.1.3.2.1	M	1	Compound
3.2.1.3.2.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.3.3	Intermediate Point	Point on a curve	Line 3.2.1.3.3.1	C - if one or more intermediate points exist	N	Compound
3.2.1.3.3.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.2	Curve Segment	Homogenous segment of a curve	Lines 3.2.2.1 - 3.2.2.2.3.1	C - if the GU consists of curve segments	N	Compound
3.2.2.1	CurveSegID	Identification of the curve segment	Free Text, Free Number	M	1	Text/Real
3.2.2.2	Curve Segment Coordinate Set	Sequences of numbers designating the positions of points	Lines 3.2.1.2.1 - 3.2.2.2.3.1	M	N	Real
3.2.2.2.1	Start Point	First point of a curve	Line 3.2.2.2.1.1	M	1	Compound
3.2.2.2.1.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.2.2.2	End Point	Last point of a curve	Line 3.2.2.2.2.1	M	1	Compound
3.2.2.2.2.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound

3.2.2.2.3	Intermediate Point	Point on a curve	Line 3.2.2.2.3.1	C - if one or more intermediate points exist	N	Compound
3.2.2.2.3.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.3	Coordinates	Sequence of numbers designating the position of a point	Lines 3.2.3.1-3.2.3.3	M	N	Compound
3.2.3.1	X	Latitude Coordinate	Free Number	M	1	Real
3.2.3.2	Y	Longitude Coordinate	Free Number	M	1	Real
3.2.3.3	Z	Altitude Coordinate	Free Number	O	1	Real

Annex I
(informative)

Referenced publications

U.S. Government. Office of Management and Budget. *Circular A-16*. 2002.